

BAYKON

LM 4

INDUSTRIAL DOSING TERMINAL OPERATION MANUEL

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ATTENTION

- Check power supply voltage and ground connection before power on.
- Do not power up the unit without load cell connector is plugged.
- During operation do not disconnect load cell and serial port connectors.
- For stable working condition and safety, operate unit with proper grounding conditions.
- Do not open the the terminal box while it is powered on.

1. GENERAL FEATURES

- LM 4 is a fast, accurate and professional terminal designed for general dosing and receipt formulation processes.
- It has 3 different working modes:

MODE	DESCRIPTION	SAMPLE
Mode 0	Dosing into a drum or container (Max. 24 components)	Directly dosing in a drum, tin or container.
Mode 1	Dosing in a tank or hopper (Max. 24 components)	In production plant, dosing into a tank, hopper or bunker.
Mode 2	Dosing in a tank or hopper and discharging (Max. 23 components)	In production plant, dosing into a tank, hopper, bunker and discharging.

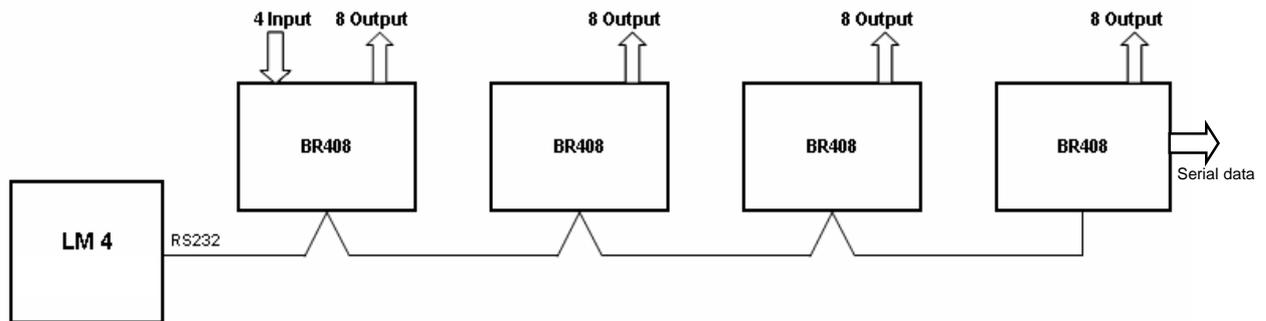
- Up to 24 different components
- 99 receipt formulation can be stored in LM 4 memory and receipts can be recalled by a code.
- Receipts can be selected via parallel I/O port or terminal keypad.
- Totals of each receipts and general totals are saved in the memory and can be displayed or printed out.
- Material usage values can be displayed or printed out.
- Keypad lock function for safety.
- Password for safety.
- Real time clock for date and time.
- Standard RS-232C data output for printer or host.

CAUTION

Before commissioning please read the manual and apply the steps in Appendix 4.

2. OPERATION PRINCIPLE

LM 4 terminal is designed for multi-component dosing. A principal system schema is given below :



LM 4 controls the process via BR408 relay units which are connected to LM 4 via serial port. The number of BR408 relay units is depend on the operation mode and the number of components. Please first decide your operation mode and the number of BR408 as described in section 6.2. Maximum 4 units BR408 can be connected to LM 4.

System control input signals Start , Reset, Emergency Stop, Klape Position and common outputs Dosing Ended, Error, Ready, Discharge, Fast Feed are located on the 1st. BR408 unit. Component selects are used as Fine feed at the mean time.

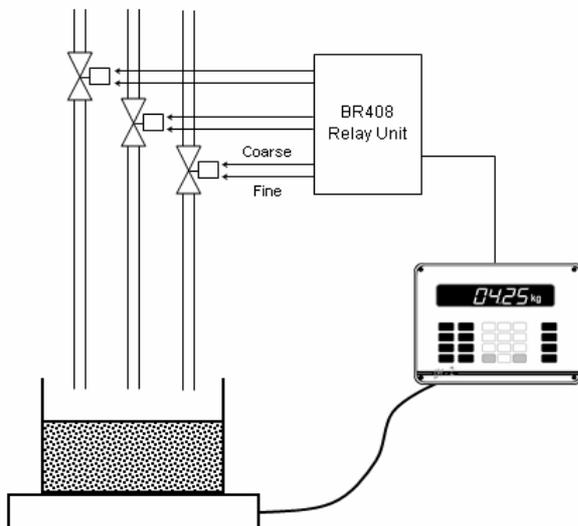
Parallel inputs and outputs of BR408 units are given in details in page 12.

3. OPERATION MODES

LM 4 has 3 different operation modes as explained below:

3.1. MODE 0 :

Mode 0 is used for direct dosing into a tin, drum or container. Tare is taken automatically and the dosing process goes on as explained below and ends when the tin, drum or the container is removed from the platform.



Initial Conditions for starting the process :

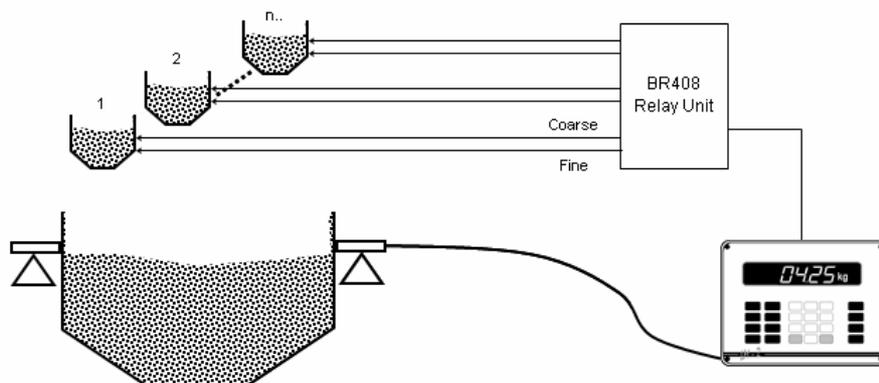
- 1) Tare has to be in the tare tolerances
- 2) Total receipt weight has to be smaller than the Maximum Capacity parameter defined in setup.

Operation:

- 1) The tin , drum or container placed on the platform and Start button is pressed.
- 2) Automatic tare is taken.
- 3) Coarse feeding of the first material in the receipt starts.
- 4) Coarse feeding ends and fine feeding starts when the weight reaches the fine feeding value.
- 5) Fine feeding ends when the weight reaches to target value.
- 6) The filling tolerance control is done after stability period if tolerance control is enabled.
- 7) If the material weight is less than minus tolerance, it is automatically added by fine feeding until it goes into tolerances.
- 8) The next material is weighed from step 2. above.
- 9) "Dosing Ended" output is produced after the last material.
- 10) Process ends when the tin, drum or container is removed from the platform.

3.2. MODE 1 :

Mode 1 is used for dosing into a tank, hopper or mixer. When the Start comes the tank is checked if it is empty. The materials are dosed after zeroing the tank, hopper.



Initial Conditions for starting of the process :

- 1) The weight of the tank has to be in zero range.
- 2) Total receipt weight has to be smaller than the Maximum Capacity parameter defined in setup.

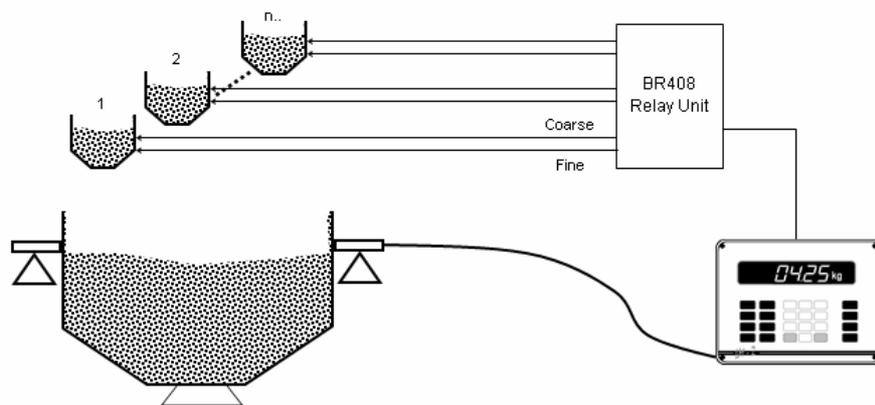
Operation :

- 1) When the start comes it is checked if the weight is in zero range which means tank is empty.
- 2) If the bottom klappe is close, auto zeroing is applied.
- 3) Coarse feeding of the first material in the receipt starts.
- 4) Coarse feeding ends and fine feeding starts when the weight reaches the fine feeding value.

- 5) Fine feeding ends when the weight reaches to target value.
- 6) The filling tolerance control is done after stability period if tolerance control is enabled.
- 7) If the material weight is less than minus tolerance, it is added by fine feeding until it goes into tolerances.
- 8) The next material is weighed from step 3. above.
- 9) “ Dosing Ended “ output is produced after the last material.

3.3. MODE 2 :

Mode 2 is used for dosing into a tank, hopper. When the Start comes the tank is checked if it is empty. The materials are dosed after zeroing the tank, hopper. The tank is discharged when the discharge input comes. After discharging the system waits ready for the next batch.



Conditions for starting of the process :

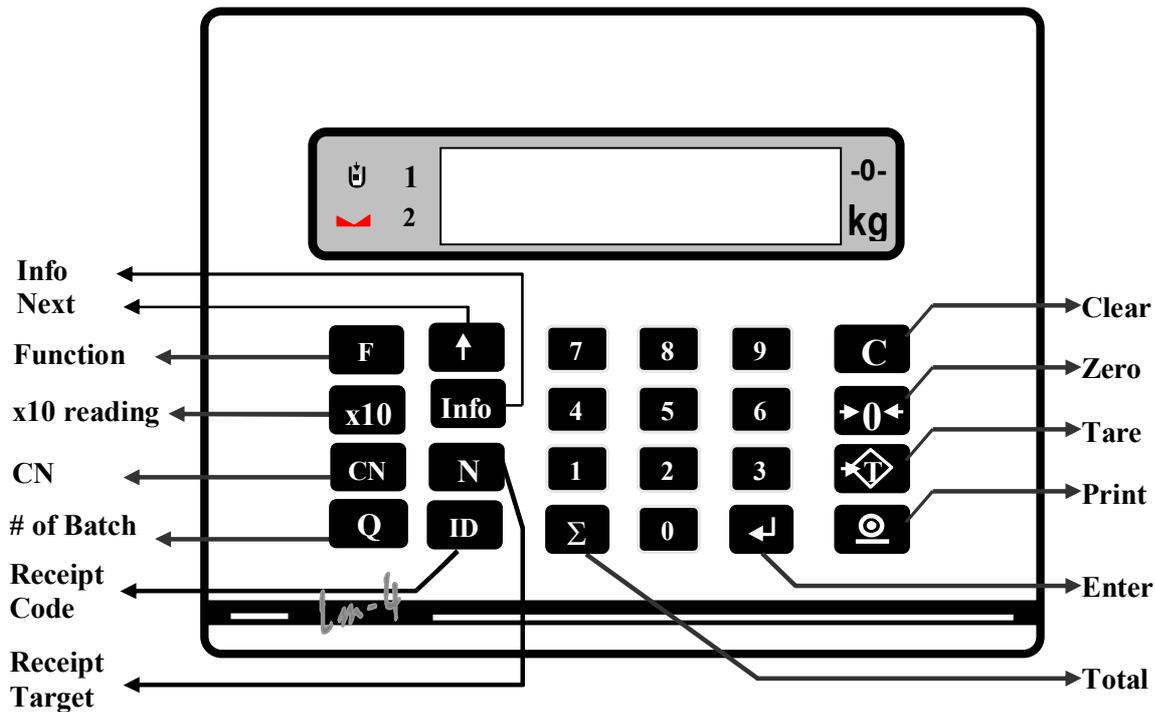
- 1) Total receipt weight has to be smaller than the Maximum Capacity parameter
- 2) The weight of the tank has to be in zero range. defined in setup.

Operation :

- 1) When the start comes it is checked if the weight is in zero range which means tank is empty.
- 2) If the bottom klape is close, auto zeroing is applied
- 3) Coarse feeding of the first material in the receipt starts.
- 4) Coarse feeding ends and fine feeding starts when the weight reaches the fine feeding value.
- 5) Fine feeding ends when the weight reaches to target value.
- 6) The filling tolerance control is done after stability period if tolerance control is enabled.
- 7) If the material weight is less than minus tolerance, it is added by fine feeding until it goes into tolerances.
- 8) The next material is weighed from step 3. above.
- 9) “ FULL “ message is produced after the last material.
- 10) Tank is discharged when the discharge input comes.
- 11) When the weight goes into Zero range, klape is kept open for Discharge Delay period to make the tank completely empty and klape is closed.
- 12) “ Dosing Ended “ output is produced.

4. FRONT PANEL AND KEY FUNCTIONS

LM 4 terminal front panel:



The symbols on the display :



Zero indication: Zero symbol illuminates when the scale is within +/- 0.25 increments of the center zero.



Stability : Indicates that the weight is stable. Zero, Tare and Print functions are inhibited while the scale is not stable.



Coarse feed : Indicates that the material is in coarse feed.

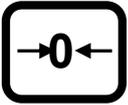


Component no 1X : Together with the first digit on the left of the display, it indicates the components number between 10 and 19.



Component no 2X : Together with the first digit on the left of the display it indicates the components number between 20 and 24.

LM 4 keys:



Zeroing : This key is used to compensate small changes in weight when the scale platform is empty. This key is active in weighing mode.



Tare : Not used.



Clear : Clears the numeric entries.



Print : Data in LM 4 is sent to PC or printer by this key.



High resolution : Weight value is displayed as 10 times in high resolution by pressing this key. This key is used for testing purposes.



Next : It is used in Dosing parameters, Programming and Calibration to go to the next step or to change the parameter.



Total : The selected receipt total is shown on the display when this key pressed.  key is pressed again to return back. Totals are displayed up to 7 digits.



Number of Batch: It displays the the number of dosed receipt which is in process. This key is pressed again to return back.



Receipt Code : It displays the receipt code in process. This key is pressed again to return back.



Receipt total weight : It displays the total weight of receipt in process. This key is pressed again to return back.



Batch number : This is key shows the batch number up to 6 digit. LM 4 automatically increases Batch number after each dosing. During batch number indication,  key pressed to make batch number zero or CN key is pressed to return back.



Function : This key gives different meaning to the key pressed after Function key. It is particularly used in Dosing parameters, Setup and Calibration and Totalizing features.

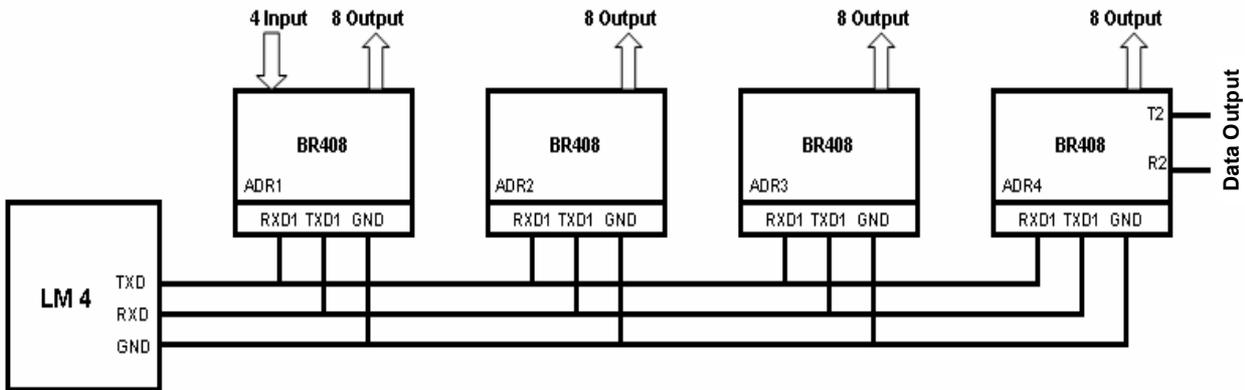
5. ELECTRICAL CONNECTIONS :

5.1. Load cell Connector (DB9 FEMALE)

PIN NO	ANLAMI	LOAD CELL (With 6 cable)	LOAD CELL (With 4 cable)
1	+ EXCITATION	+ EXCITATION	+ EXCITATION
2	+ SENSE	+ SENSE	+ EXCITATION
3	SCHIELD	SCHIELD	SCHIELD
4	- SENSE	- SENSE	- EXCITATION
5	- EXCITATION	- EXCITATION	- EXCITATION
7	+ SIGNAL	+ SIGNAL	+ SIGNAL
8	- SIGNAL	- SIGNAL	- SIGNAL

5.2. BR 408 Relay unit connection

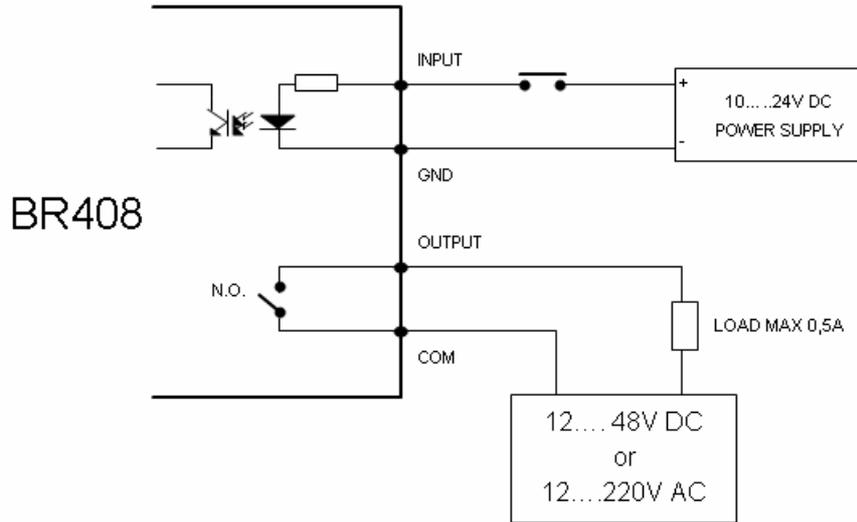
BR408 relay units are connected to LM 4 indicator via serial port as shown below. BR408 units are addressed by dip switches on them.



LM 4		BR 408
Pin No	Description	Connection
2	TXD	RXD 1
3	RXD	TXD 1
7	GND	GND

5.3. CONNECTION OF INPUTS AND OUTPUTS

You can see input and output schema of BR408 relay unit. Isolated 24 VDC should be applied to inputs and outputs.



6. INPUTS AND OUTPUTS

Inputs and outputs of dosing system are located on BR408 relay units. Maximum four addressable BR408 units can be connected to LM 4. All inputs are located on the 1st BR408 relay unit. The details can be found in the following.

6.1. INPUTS:

LM 4 inputs are applied through 1st BR408 relay unit as indicated below:

BR408 Address	BR408 Input No	LM 4 Input no	MODE-0	MODE-1	MODE-2
1	1	1	Start / Err. Ack.	Start / Err. Ack.	Start / Err. Ack.
	2	2	Emergency stop	Emergency stop	Discharge
	3	3	Reset	Reset	Reset
	4	4		Bottom Klape	Bottom Klape

- Start / Error Acknowledge** : Starts process. If the system is in Error status and this input accepts the error and filling/Discharging goes on.
- Emergency stop** : This input is valid in Mode 0 and Mode 1. If this input is passive system halts.
- Reset** : Resets the process. In “ Ready” status , Reset input is used to select Receipt via parallel input.
- Klape** : This input provides klape position data for Mode 1 and Mode 2. Klape has to be closed to start filling.
- Discharge** : Starts discharging for Mode 2.

6.2. OUTPUTS

General dosing output signals DOSING ENDED, ERROR, READY, FAST FEED and DISCHARGE (Mode 2 only) are located on the 1st BR408 relay unit.

Dosing ended (EOB) : This output indicates the end of dosing process. It stays active until the next batch start.

Error : It becomes active if error happens. Pressing Error/Ack. Key or Reset key make Error output passive.

Ready : This output informs the system is ready for dosing. In mode 2, this output also become active when the tank is full before discharging.

Fast feed : It indicates coarse feeding.

Discharge : This output is used for discharging (Mode 2)

Material select outputs are also used as Fine feed for fine feeding.

LM 4 outputs are indicated in the following table:

BR408 Address	BR408 Outpt no	LM 4 Outpt no	MODE-0	MODE-1	MODE-2
1	1	0	Dosing ended	Dosing ended	Dosing ended
	2	1	Error	Error	Error
	3	2	Ready	Ready	Ready
	4	3	Coarse feed	Coarse feed	Coarse feed
	5	4	Comp.1/Fine feed	Comp.1/Fine feed	Discharge
	6	5	Comp.2/Fine feed	Comp.2/Fine feed	Comp.1/Fine feed
	7	6	Comp.3/Fine feed	Comp.3/Fine feed	Comp.2/Fine feed
	8	7	Comp.4/Fine feed	Comp.4/Fine feed	Comp.3/Fine feed
2	1	8	Comp.5/Fine feed	Comp.5/Fine feed	Comp.4/Fine feed
	2	9	Comp.6/Fine feed	Comp.6/Fine feed	Comp.5/Fine feed
	3	10	Comp.7/Fine feed	Comp.7/Fine feed	Comp.6/Fine feed
	4	11	Comp.8/Fine feed	Comp.8/Fine feed	Comp.7/Fine feed
	5	12	Comp.9/Fine feed	Comp.9/Fine feed	Comp.8/Fine feed
	6	13	Comp.10/Fine feed	Comp.10/Fine feed	Comp.9/Fine feed
	7	14	Comp.11/Fine feed	Comp.11/Fine feed	Comp.10/Fine feed
	8	15	Comp.12/Fine feed	Comp.12/Fine feed	Comp.11/Fine feed
3	1	16	Comp.13/Fine feed	Comp.13/Fine feed	Comp.12/Fine feed
	2	17	Comp.14/Fine feed	Comp.14/Fine feed	Comp.13/Fine feed
	3	18	Comp.15/Fine feed	Comp.15/Fine feed	Comp.14/Fine feed
	4	19	Comp.16/Fine feed	Comp.16/Fine feed	Comp.15/Fine feed
	5	20	Comp.17/Fine feed	Comp.17/Fine feed	Comp.16/Fine feed
	6	21	Comp.18/Fine feed	Comp.18/Fine feed	Comp.17/Fine feed
	7	22	Comp.19/Fine feed	Comp.19/Fine feed	Comp.18/Fine feed
	8	23	Comp.20/Fine feed	Comp.20/Fine feed	Comp.19/Fine feed
4	1	24	Comp.21/Fine feed	Comp.21/Fine feed	Comp.20/Fine feed
	2	25	Comp.22/Fine feed	Comp.22/Fine feed	Comp.21/Fine feed
	3	26	Comp.23/Fine feed	Comp.23/Fine feed	Comp.22/Fine feed
	4	27	Comp.24/Fine feed	Comp.24/Fine feed	Comp.23/Fine feed
	5	28	Receipt no D0	Receipt no D0	Receipt no D0
	6	29	Receipt no D1	Receipt no D1	Receipt no D1
	7	30	Receipt no D2	Receipt no D2	Receipt no D2
	8	31	Receipt no D3	Receipt no D3	Receipt no D3

7. COMMISSIONING

You should first enter weighing parameters and calibrate LM 4. Apply parallel input and output test. Enter dosing parameters – first configuration and then material and receipt data. LM 4 is ready to start.

7.1. EDITTING,COPYING AND DELETING OF RAW MATERIAL DATA :

Up to 24 components data can be stored into LM 4.

Editing components can be found in section 8.2 in details. A number is given for each component . Before editing receipts, components have to be entered first. For a new component, the data of previously entered component can be copied first and saved as a new component data and then the necessary changes can be made on it.

To copy a component data ; In Dosing Parameters Block select the component to be copied by key and press key. **[CoPY X]** message is displayed. Enter the number of new component and press key.

Deleting a component ; In Dosing Parameters Block select the component to be deleted by key and press key. **[dEL mat]** message is displayed. Press key to delete the component.

7.2. EDITTING,COPYING AND DELETING OF RECEIPT DATA :

Up to 99 receipt data can be loaded in LM 4 terminal.

Editing a receipt can be found in section 8.3 in details. A number is given for each receipt data. For a new receipt, the data of previously entered receipt can be copied first and saved as a new receipt data and then the necessary changes can be made on it.

Copying a receipt ; In Dosing Parameters Block select the receipt to be copied by key and press key. **[CoPY X]** message is displayed. Enter the number of new receipt and press key.

Deleting a receipt ; In dosing Parameters Block select the receipt to be deleted by key and press key. **[dEL rec]** message is displayed. Press key to delete the receipt.

7.3. RECEIPT SELECTION

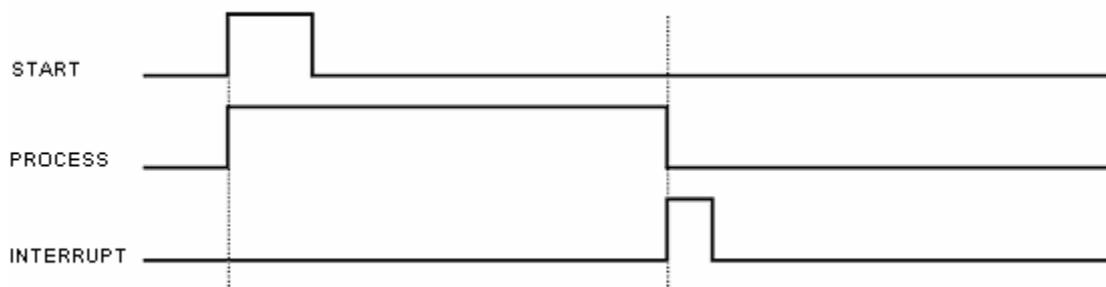
When LM 4 is powered on, it goes into weighing mode. ID key is pressed to go into dosing mode and receipt number is entered. Receipt number can be enter by numeric keys or can be selected by key and pressing key. The total weight of the receipt is displayed as [n XXXX]. If requested, the target weight can be changed without changing receipt formulation. Press key, [Q XXX] indicating the number of batch. If you enter any number as (Q), LM 4 returns to Weighing mode after this entered number of batches. If zero is entered as number of batch, the selected receipt is done one after another.

However, RESET input is used to select receipt. When LM 4 is in READY status, first make Emergency Stop as passive and pressing Reset inputs changes Receipt numbers. Apply START input after the receipt is selected. This selection can also be done by PLC.

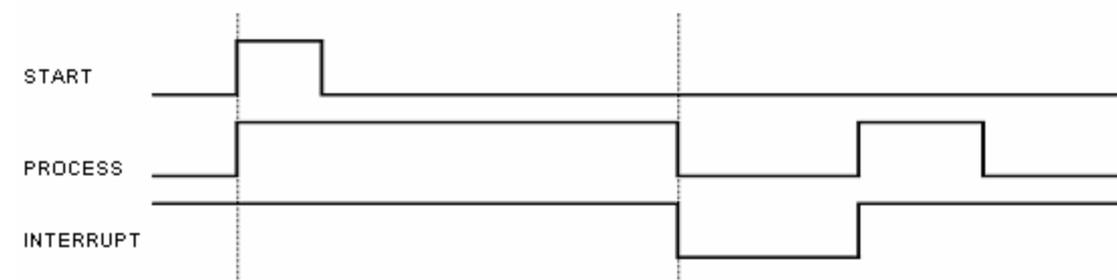
To control the selected receipt number, the last 4 output of 4th BR408 relay box can be used. Those outputs represent 4 digits of selected receipt number up to 15 in binary format.

7.4. DOSING OPERATION

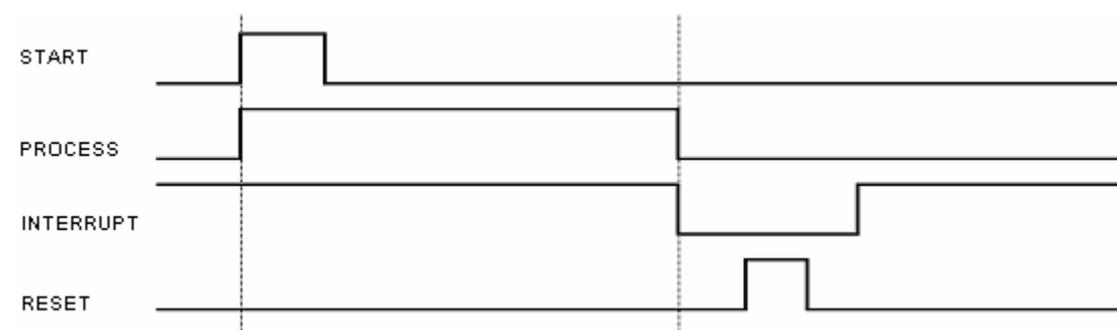
The blinking letter “ r ” on left side of LM 4 display indicates that LM 4 is in READY status for dosing. If Emergency Stop is not used as an input of LM 4, process starts by START input. If Reset input comes during process, dosing ends and a new start is needed for the next process.



If Emergency Stop is used as an input of LM 4, process starts by START input. If Emergency Stop becomes passive during process, dosing is halt and it goes on if Emergency Stop is active again.



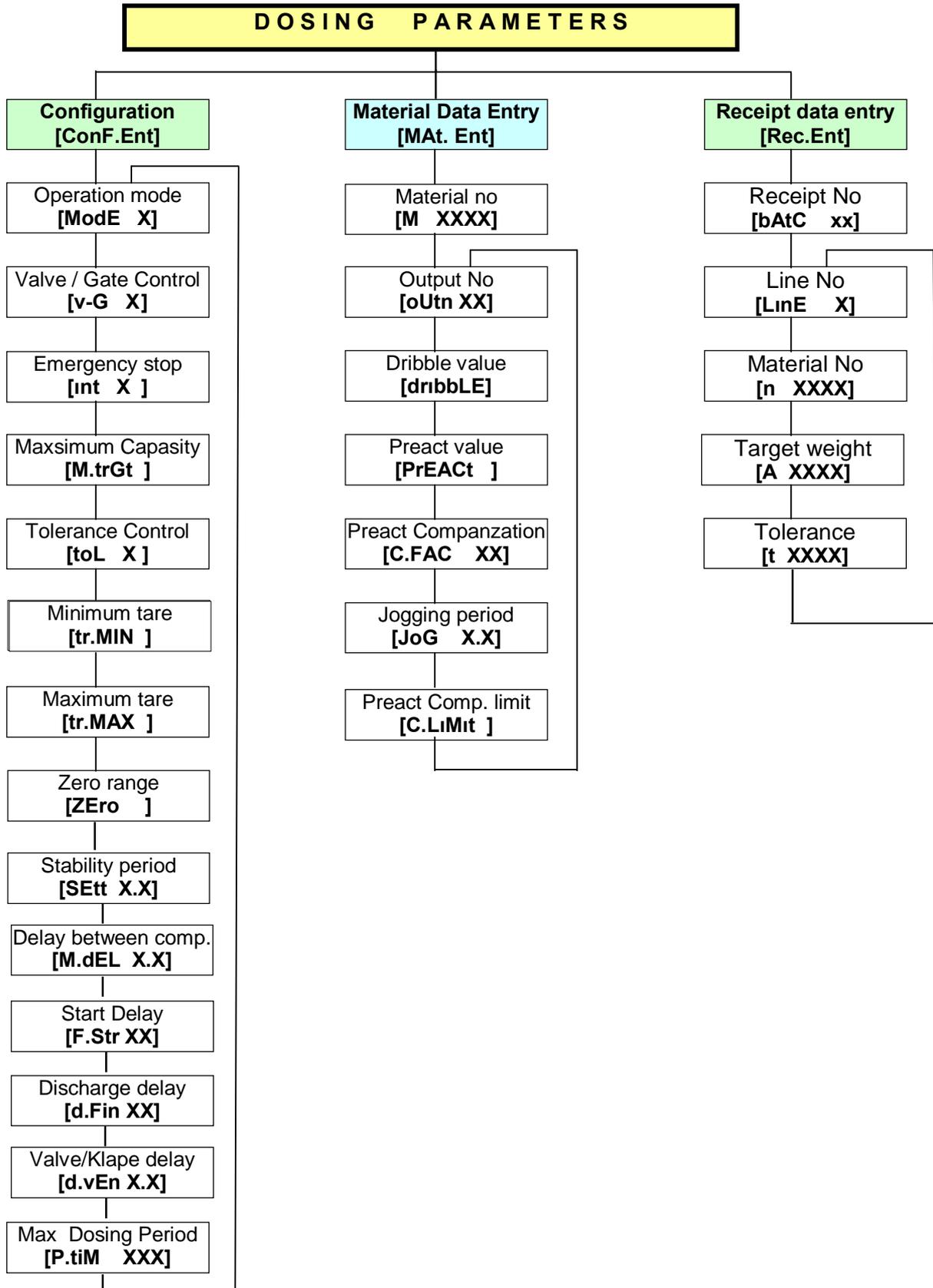
If Emergency Stop is used as an input of LM 4, process starts by START input. If Emergency Stop becomes passive and Reset input is applied, dosing process ends and wait for a new start.



The components are weighed one by one with the order in receipt. Automatic taring is done between the components and automatic batch report is given at the end of batch.

8. DOSING PARAMETERS

In this section, the dosing parameters which are convenient for your process are entered. Dosing parameters consist of 3 sections: Configuration, Components data and Receipt data. This section is very important and critical for your process. Please read this section very carefully.



To enter Dosing parameters and keys are pressed consecutively. The message [Password] appears. Password is entered and key is pressed, the message **[ConF.Ent]** comes to display directly which means you are in the configuration mode. The changed values are saved automatically.

If password is not correct [no.PASSII] message appears. After pressing key once more, the message [ConF.Ent] comes to display. You are also in configuration, however you can reach the parameters, but you can not change them.

When the display has **[ConF.Ent]** message, key is pressed to access the blocks related Material and Receipt data.

To exit from Configuration, key is pressed consecutively until the weight comes to display.

8.1 [ConF.Ent] CONFIGURATION PARAMETERS :

To go into Configuration parameters block key is pressed when the display has **[ConF.Ent]** message. In the configuration block, key is pressed to go to next parameter. The changed value is accepted by pressing key or declined by pressing key. If Function key is pressed in any place in the configuration, you can reach directly Material Data Entry Block.

[ModE X] Proses Mode :

- X = 0 : Mode 0 (Dosing in a tin, drum or container)
- X = 1 : Mode 1 (Dosing in a weighed tank, reactor or hopper)
- X = 2 : Mode 2 (Dosing in a weighed tank, reactor or hopper and discharging)

The value is entered by numeric keys and key is pressed.

[v – G X] Valve / Gate Control :

Indicates if the bottom valve/Klape position will be checked.

- X=0 : Without Valve / Gate control
- X=1 : With Valve / Gate control

The value is entered by numeric keys and key is pressed.

[int X] Emergency stop :

- X=0 : Emergency stop input is active
- X=1 : Emergency stop input is passive

The value is entered by numeric keys and key is pressed.

[M.trGt] Maximum capacity :

This parameters indicate the maximum dosing capacity.

The value is entered by numeric keys in [xxxxxx kg] format and key is pressed.

[toL X] Tolerance Control :

This parameters defines the tolerance control will be done after each material weighing.

X=0 : Without tolerance control .

X=1 : With tolerance control

The value is entered by numeric keys and  key is pressed.

[tr.Min] Minimum tare :

Indicates the minimum tare value. Error signal is produced if tare value is less then minimum tare.The value is entered by numeric keys in [xxxxxx kg] format and  key is pressed.

[tr.MAX] Maximum tare value :

Indicates the maximum tare value. Error signal is produced if tare value is bigger then minimum tare. The value is entered by numeric keys in [xxxxxx kg] format and  key is pressed.

[ZEro] Zero range :

The tank considered empty if the weight is less then this value.

The value is entered by numeric keys in [xxxxxx kg] format and  key is pressed.

[SEtt X.X] Settling time :

At the end of material weighing, LM 4 waits for the stability period to get correct weight to make error correction for the next batch. This value is entered as a multiplier of 0,1 sn. The value is entered by numeric keys and  key is pressed.

[M.dEL X.X] Delay between materials :

This parameters defines the delay for the next material weighing. It is entered as a multiplier of 0,1 sn and the maximum delay is 9,9 sec.

The value is entered by numeric keys and  key is pressed.

[F.Str X.X] Start delay :

LM 4 waits for this period after Start input comes. . It is entered as 0,1 sn and the maximum delay is 9,9 sec.

The value is entered by numeric keys and  key is pressed.

[d.Fin XX] Discharge finish delay:

During discharge, when the weight goes into zero range, LM 4 additionally waits for discharge delay to make the tank empty. This timer starts automatically when the weight is less then zero range value. It is entered as a multiplier of 0,1 sn and the maximum delay is 9,9 sec.

The value is entered by numeric keys and  key is pressed.

[d.uEn X.X] Valve / Gate position delay :

The valve / Gate has to be open during this period after the Valve / Gate open input comes. If this parameter is not important for you can enter as 5,0 sec.

The value is entered by numeric keys and  key is pressed.

[P.tiM X] Maximum Process Time:

If dosing does not end during this period Error signal is produced and Start input is waited for. For mode 2, this period is applied for Dosing and Discharging respectively. It is entered as minute and the maximum period is 99 minutes.

The value is entered by numeric keys and  key is pressed.

8.2 [Mat. Ent] MATERIAL PARAMETERS :

To go into Material parameters block  key is pressed when the display has [MatE.Ent] message. In the material block,  key is pressed to go to next parameter. The changed value is accepted by pressing  key or cleared by pressing  key. If Function key is pressed in any place in the configuration, you can reach directly Receipt Block.

[M XXXX] Material No :

To define the material parameters, the material number is entered first in this parameter or you can also select any previously entered material by  key. The parameters below are entered for each material separately.

[oUtn XX] Output No :

Define the output number for the selected material.

The value is entered by numeric keys and  key is pressed.

[dribbLE] Dribble value :

When the weight approaches the target value as close as dribble value, the coarse feeding ends and fine feeding starts. For example, let target value is 100 kg and dribble value is 2 kg. When weight is 98 kg, fast feed ends and Fine feed starts.

The value is entered by numeric keys and  key is pressed.

[PrEACt] Preact value :

When the weight approaches the target value as close as preact value, the fine feeding ends. For example, let target value is 100 kg and dribble value is 0,2 kg. When weight is 99,8 kg, feeding stops.

The value is entered by numeric keys and  key is pressed.

[C.FAC XX] Preact adjustment :

If preact adjustment is entered any value different then zero, preact value is adjusted by the entered rate according to the filling error to minimize the filling error for next filling. The enter value is considered as percentage and the correction is done % XX rate. If it entered as zero, preact correction is not applied.

[JoG X.X] Jogging time :

At the end of filling, if the weight is less than minus tolerance, a fine feed pulse is applied consecutively until the weight goes into tolerances. If this value is zero, jogging is not applied.

[C.LiMit] Preact adjustment limit :

If the filling error is bigger than this value, preact adjustment is not applied.

8.3. [rec. Ent] RECEIPT PARAMETERS :

To go into Material parameters block  key is pressed when the display has [bAt.Ent] message. In the receipt block,  key is pressed to go to next parameter. The changed value is accepted by pressing  key or declined by pressing  key. If Function key is pressed in any place in the configuration, you can reach directly Configurasyon Block.

[rec XX] Receipt No:

Receipts are stored in LM 4 according to their number.

[Line X] Sequence no :

This number indicates the place of the component in dosing sequence. The component which has a certain sequence number is being accessed by  key.

[M XXXX] Material No :

Defines the material number. The value is entered by numeric keys and  key is pressed.

[A xxxx] Target weight :

Defines the target weight of the material. The value is entered by numeric keys and  key is pressed.

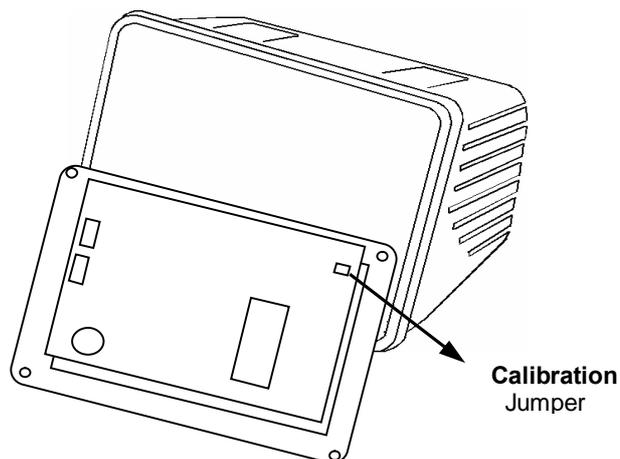
[t xxxx] Tolerance:

It appears if the tolerance control is active. It defines the filling tolerances. The value is entered by numeric keys and  key is pressed.

9. WEIGHING PARAMETERS AND CALIBRATION

The following steps are taken to go into programming and calibration parameters:

- Disconnect the power
- Open LM 4 by 4 screws at the corners of front panel and connect the calibration jumper as indicated below.
- Close LM 4 by one screw at any corner and power up.



Key functions in the programming:



Function key is used to go into set-up or to go out from any programming blocks. While the message **[save 1]** is displayed. This key is used to reserve the entered parameters until power off .



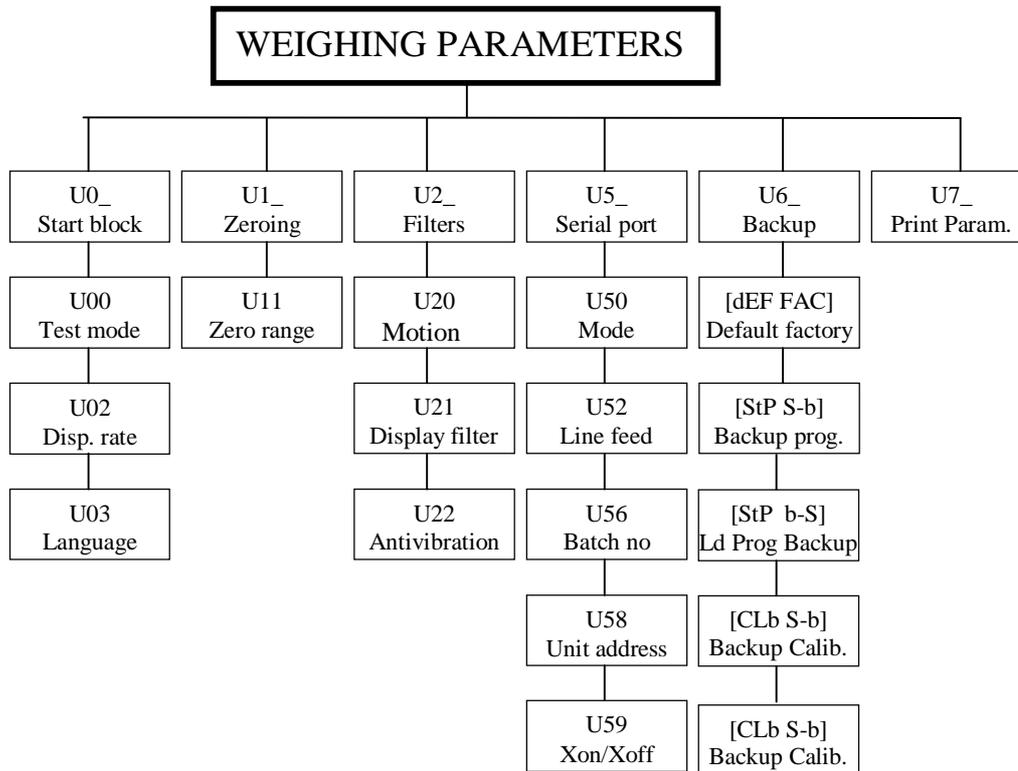
This key is used to go to the next parameter in programming or to change the value of the selected parameter.



This key is used to go into the selected programming block. The displayed or entered value is accepted by this key.

9.1. WEIGHING PARAMETERS

- Press **[F]**, **[8]** keys consecutively, enter password and press **[↵]** key.
- The message **[U0-]** will appear indicating that you are in programming mode.
- Select the desired programming block by **[↓]** key enter the block by pressing **[↵]** key.
- To get out of programming press **F** key one after another until **[Save]** message appears. Press **(1)** key to save changes or press **F** key again to reserve the changes until power off.



[U0] Starting parameters block

This is the first block displayed in the programming. By pressing **[F]** key to go to the next block. Please press **[↵]** key to access to the subblocks in this block.

[U00 X] x10 Test mode

- X=0 Normal weight indication, x10 key disable
- X=1 Display shows normal weight data, x10 key enable
- X=2 Weight is displayed in x10 higher resolution in high resolution for testing.

- [↑]** is used to select the requested value.
- [↵]** is used to go to next parameter.

[U02 X] Display update rate

This parameter defines the display update rate of LM 4. This parameter can be from 1 to 9 by **[↑]** keys. This number is multiplied by 100 ms to find display update speed.

- [↵]** is used to go to next parameter.

[U03 X] Language

X=0 English.

X=1 Turkish

 is used to select the requested value.

 is used to go to next parameter.

[U1] Zeroing Parameters Block

[U11 X] Zero range

Zero key will be active within the weight limit below.

X=0 Zero button is not active.

X=1 % 2 of scale capacity.

 is used to select the requested value.

 is used to go to next parameter.

[U2] Filters Parameters Block

[U20 X] Motion detection

This parameter defines if the weighing is stable. It can be entered via numeric keys from 0,0 to 9,9. If the change of the weight indication is within the entered value, then, the weighing considered as stable. Zero, tare and print keys are inhibited if the scale is in-motion. X=0.0 disables in motion detector.  is used to go to next parameter.

[U21 X] Display filter

This is standard digital filter against wind or other environmental effects.

X=0 No Filter.

X=1 Low level.

X=2 Medium level.

X=3 High level.

X=4 Very high level.

 is used to select the requested value.

 is used to go to next parameter.

[U22 X] Vibration and damping filter

This filter is particularly effective against vibration because of mixing or agitating.

X=0 No filter.

X=1 Very low level.

X=2 Low level.

X=3 Medium level.

X=4 High level.

 is used to select the requested value.

 is used to go to next parameter.

[U5] Serial port parameters

[U50 X] Data mode

X=0 : No serial data.
X=1 : Continuous mode.
X=2 : Standart-1 data in Demand mode.

is used to select the requested value.
 is used to go to next parameter.

[U52 X] Line feed

This parameter defines the number of line feed at the end of ticket. Can be typed in from 1 to 9 by numeric keys.

is used to select the requested value.
 is used to go to next parameter.

[U56 X] Batch Number

X=0 : Batch no will not be printed.
X=1 : Batch no will be printed.

is used to select the requested value.
 is used to go to next parameter.

[U58 X] Unit address :

The unit address of LM 4 must be configured as " 0 " by this parameter.

[U59 X] Xon/Xoff :

X=0 : Disables Xon/Xoff.
X=1 : Enables Xon/Xoff.
This parameter must be " 0 " to communicate with BR408 unit.

is used to select the requested value.
 is used to go to next parameter.

[U6] Backup Parameters Block

In this block, the backup operations are organised. Default memory is the memory area to keep factory settings, approval settings, programming and calibration backup. and those values cannot be changed.

PLEASE BE VERY CAREFUL WHILE WORKING IN THIS BLOCK NOT TO DESTROY YOUR SETUP AND CALIBRATION VALUES.

[dEF FAC] Loading factory setup:

Please press key to load factory default parameters as setup values.

[StP S-b] Backup programming parameters:

Please press key to save programming values into programming backup memory.

[StP b-S] Loading programming backup

Please press key to load the programming backup memory as programming parameters.

[CAL S-b] Backup calibration parameters:

Please press key to save calibration values into the calibration backup memory.

[CLb b-S] Loading calibration backup

Please press key to load the calibration backup memory as calibration parameters.

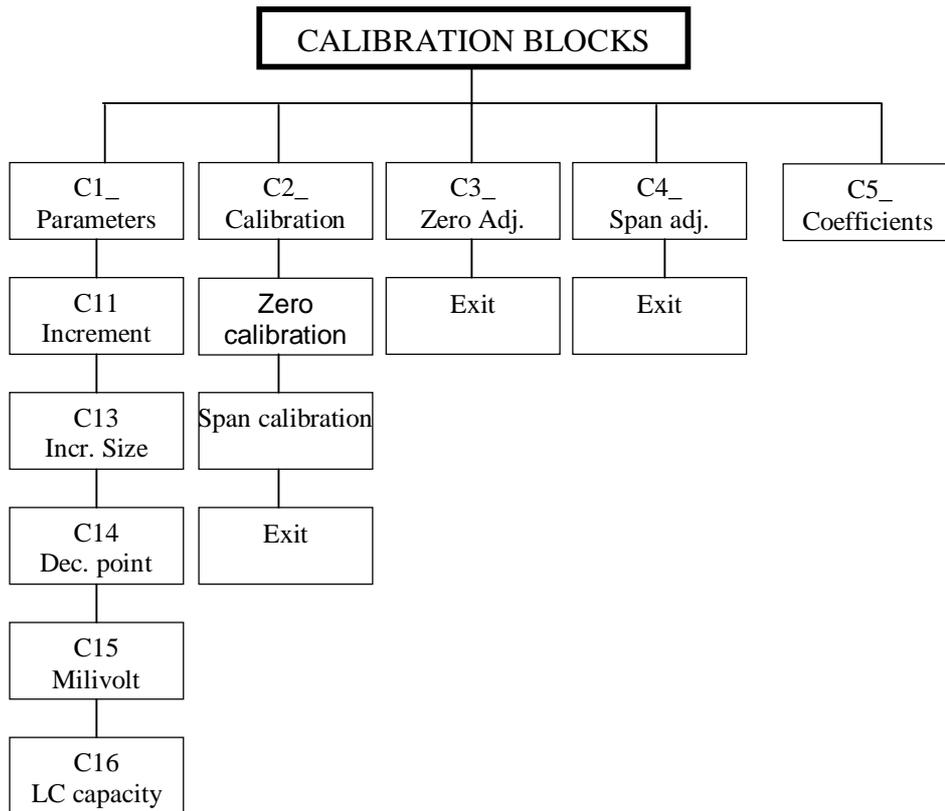
[U7] Printing Setup parameters

You can get the list of setup parameters in this block. Please press key. LM 4 will return to **[U0-]** block after printing.

9.2 CALIBRATION

To get into calibration:

- Please press **[F]**, **[9]** keys consecutively, type in the password and press **[↵]** key.
- The message **[C1-]** will appear on the display. There are 5 main block in the calibration menu. You can select the requested block by **[↓]** keys and press **[↵]** key to go into the selected block.
- **[F]** is pressed to go out from any block.



[C1] Calibration Parameters Block

[C11 X] Increment Number

Please select your increment size by pressing **[↑]** keys from 1000 to 20000. The possible values for increment size are indicated in Table I. The relation between scale capacity and increment size can be found in section “Relation between scale capacity and increment size”.

[↵] is pressed for the next step.

[C13 X] Increment size

Can be selected as 1,2 or 5. Indicates step of increment on the display.

[↑] is used to select the requested value.

[↵] is used to go to next step.

[C14 X] Decimal point

Decimal point can be selected as 10, 1, 0.1, 0.01, 0.001 and 0.0001.

is used to select the requested value.

is used to go to next step.

[C15 X.X] Load cell sensitivity

The load cell sensitivity is typed via numeric keys from 0.0 to 9.9 mV/V.

is used to go to next step.

[C16 X] Maximum load cell capacity

Maximum load cell capacity is multiplication of number of cells and load cell capacity. For example, for 4 load cells each with the 1000 kg in the scale, the maximum load cell capacity is 4000 kg. You can type this value by numeric keys and press key to go to next parameter.

Relation between scale capacity and increment size

The Table.I the possible values for C11, C13 and C14 are indicated.

C11	1000, 1500, 2000, 2500, 3000, 4000, 5000, 6000, 7500, 8000, 10000, 12000, 15000, 16000, 20000
C13	1, 2, 5
C14	0.0001, 0.001, 0.01, 0.1, 1, 10

Table.I: Possible values for C11, C13 and C14

Scale capacity= C11 x C13 x C14

C13= Readability/ C14

Example 1 : Let the scale is 100 kg x 0.02 kg (20 g)

Capacity : 100 kg

Readability : 0,02 kg

Decimal point : 0.01

C14= 0.01

C13= 0.02/C14= 0.02/0.01=2

C11= Scale capacity/ C13x C14= 100/ 0.01 x 2 = 5000

Example 2: Let the scale is 1500 kg x 0.5 kg (500 g)

Capacity : 1500 kg

Readability : 0.5 kg

Decimal point : 0.1

C14= 0.1

C13= 0.5/C14= 0.5/0.1=5

C11= Scale capacity/ C13x C14= 2000/ 0.1 x 5 = 4000

IMPORTANT NOTE:

If C11 is calculated between any 2 numbers in Table.I, the bigger will be selected.

[C2] Calibration Block

1- The message [**Zero CL**] comes on the display. Please unload scale and press key. The message [**dELAY**] will come to the display. LM 4 is now getting zero value of the scale. It will take about 10 seconds and please do not touch the scale during this period.

2- The message [**CALB II**] appears and a value comes to display in 5 seconds. This value is the last entered test weight for span calibration. You can use this test weight or enter the new one. Please place the test weight on the scale and enter this value via numeric keys and press key. [**Gain CL**] message appears. Press key and the [**dELAY**] message appears. LM 4 is now getting known the test weight value and doing span calibration. It will take about 10 seconds and please do not touch the scale during this period.

3- After delay period [**CAL End**] and [**SAVe 1**] messages appears consecutively. Please press key to save the new calibration. If, key is pressed, the new calibration will be lost after power off.

[C3] ZERO ADJUSTMENT

If the zero of the scale is changed by any reason, only zero adjustment is done without complete calibration steps in this block. [**Zero CL**] message appears when you enter this block. Please empty the scale and press key. The message [**dELAY**] appears for about 30 sec. Please do not touch the scale during this period. After this period first [**CAL End**] message appears and then [**SAVe 1**] message comes. Please press key to save the new zero. If, key is pressed, the new zero value will be lost after power off.

[C4] SPAN ADJUSTMENT

If the span calibration of the scale is changed by any reason, only span calibration is done without complete calibration steps in this block. [**CALB II**] message appears when you enter this block. Please press key and the value of the last test weight appears on the display. You can use the old test weight or change it. Please place the test weight on the scale and type in this value via numeric keys and press key. [**Gain CL**] message appear and press key. The [**dELAY**] message appears. LM 4 now gets known the test weight value and doing span calibration. It will take about 20-30 sec and please do not touch the scale during this period.

After delay period [**CAL End**] and [**SAVe 1**] messages appears consecutively. Please press key to save the new calibration. If, key is pressed, the new calibration will be lost after power off.

[C5] CAL. COEFFICINTS

In this block, you can see 8 values by pressing Enter key. Please write down those values after the calibration. In case of the calibration is lost, those values are entered to calibrate the scale without calibration.

10. TESTING PARALEL AND SERIAL PORT

You can reach test menu by pressing **F** and **6** keys consecutively. You can reach the requested test by **↑** key and **F** key is press to go out from the test menu.

10.1 Parallel Output Test

Please press **↑** key until **[t0_]** message appears and press **↵** key. The message **[t00 0]** comes to display. The first 3 digit indicates the output number and the digit on the right shows the value of this output. You can change the value of output by pressing 0 or 1 keys. **↑** key is used to reach other outputs. Please press **F** key to go out from output test.

10.2 Parallel Input Test

Please press **↑** key until **[t1_]** message appears and press **↵** key. The message **[t1 XXXX]** comes to display. Each digit on the display shows the inputs respectively. X= 0 means no input and X=1 means an input is applied. Please press **F** key to go out from input test.

10.3 Testing serial port :

Please press **↑** key until **[t2_]** message appears and press **↵** key. The message **[t2_]** comes to display. If you press any key of LM 4, the display changes as **[t2_ X_]** and the ASCII value of this key is sent via serial port. If any ASCII code received from serial port, the display changes as **[t2_ X_X]**. Please connect to RXD and TXD pins of serial port connector and apply this test. you can read the value of key which is pressed on the display as **[t2_ X_X]**. Please press **F** key to go out from serial port test.

10.4 Testing Relay Box Connection

The communication between LM 4 and Relay box addressed as 1 can be tested. Please press **↑** key until **[t3_]** message appears and press **↵** key. If there exist a communication error, the message **[E rEL.Cr]** appears. If the communication is okay **[ru X.X]** message comes to display. Please press **F** key to return back.

11. CHANGING PASSWORD

Please press **F 0** keys consecutively. Please type the password and press **↵** key. The message (**Passent**) will appear on the display. Please type your new password and press **↵** key. You will see the message (**Passen2**) on the display. Please type your new password once more and press **↵** key. LM 4 will give you the message (**okay**) and return to weighing mode in a short time. If the new password is written wrongly after (**Passen2**) message, then, LM 4 displays (**err**) message and return to weighing mode. Default factory password is (**1**).

12. CHANGING DATE & TIME

Accessing Time and Date

F

Please press the keys on the left consecutively. Time will be seen on the display as [t ss.dd] format. **↑** key is pressed to see the date in [d gg.aa.yy] format. **F** key is pressed to return back.

4

Changing Time and Date :

F

Please press the keys on the left consecutively. Time will be seen on the display as [t ss.dd] format. The new Time is entered by numeric keys and **←** is pressed. If **↑** key is pressed, the Date comes to display in [d gg.aa.yy] format. The new Time is entered by numeric keys and **←** is pressed. **F** key is pressed to return back.

7

13. RECEIPT AND COMPONENT TOTALS

Component totals :

F

The keys on the left are pressed to see the components totals and to get them printed out. The message [n X] comes to display. X indicates the component number. After a few seconds the message [Q XXXXX] appears. XXXXX means the number of batch including this component and the total of this component comes as [XXXXXXXX] format. **↑** key is used to access other components' data.

2

Ⓚ key is press to get printed out.

While the total data of any component is displayed, **-0-** key is pressed to clear the component totals. After entering the password, [CLR 1/0] message comes. **1** is pressed to clear the component totals or **0** key pressed to skip. **F** key is pressed to return back.

Receipt totals:

F

The keys on the left are pressed to see the components totals and to get them printed out. The message [rEC X] comes to display. X indicates the receipt number. After a few seconds the message [Q XXXXX] appears. XXXXX means the number of batch for this receipt and the total of this batches comes as [XXXXXXXX] format. **↑** key is used to access other receipts' data. **Ⓚ** key is press to get printed out.

ID

While the total data of receipts is displayed, **-0-** key is pressed to clear the receipts totals. After entering the password, [CLR 1/0] message comes. **1** is pressed to clear the receipt totals or **0** key pressed to skip. **F** key is pressed to return back.

14. KEY LOCK FUNCTION :

This feature locks LM 4 against unauthorized usage. To go in to the key lock function , press **[F] [5]** keys in sequence. Enter password and wait for **[kYb 0/1]** prompt.. Press **[0]** key to lock the keys or press **[1]** key to cancel the key lock. In locked key operation, the keys are not functioning except function key.

15. SERIAL DATA AND REPORTS:

Serial data parameters: Baud rate is 4800, 8 data bit, 1 stop bit and None parity.

15.1 Continuous data output (U50=1):

Continuous data output format:

STX	STATUS			NET						DARA						CR
	STA	STB	STC	D5	D4	D3	D2	D1	D0	D5	D4	D3	D2	D1	D0	

The contents of status bytes can be found in Appendix.3 .

15.2. Batch Report (U50=2) :

At the end of each batch, the following batch report is given automatically. Please press **[@]** key to repeat batch report.

BATCH REPORT

```

RECEIPT      : 1
CN           : 22
Q            : 28
Date         : 06/05/2003 21:56
    
```

MATE	TARGET	ACTUAL	T.
1	1.000	1.000	0.000
2	1.000	1.152	0.152*
TOTAL	2.000	2.152	

Batch report is not given if the continuous data output is selected.

15.3. Component usage report :

If the keys F and 2 are pressed consecutively, the components totals are displayed. At this stage, if Print key is pressed, the following Component Usage report is given:

MATERIAL USAGE REPORT

Rep.D : 06/05/2003 23:00

MAT.NOxxxxxxx	B. QTYxxxxxxxxxxx	Total kg
xxxxx1xxxxxxx	24	23.993
2	20	21.254
25	0	0.000
13	0	0.000
General Total		45.247

15.3. Receipt Totals Report :

If the keys F and ID keys are pressed consecutively, the components totals are displayed. At this stage, if Print key is pressed, the following Component Usage report is given:

RECEIPT TOTALS REPORT

Date: 06/05/2003 23:04

R.NO	Qty	TOTAL (Kg)
1	18	36.075
9	5	1.867
Total	23	37.942

15.4. Printing Dosing Parameters :

In the Dosing Parameters block, Configuration parameters, material and Receipt data are printed if the Print key is pressed at the related step. If you would like to print only one component data or receipt data, print key is pressed the number of this component or the number of this receipt is displayed.

15.5. Printing Weighing Parameters :

You can get printed Weighing Parameters list by pressing Print key in the [U7-] step.

16. ERROR TABLE :

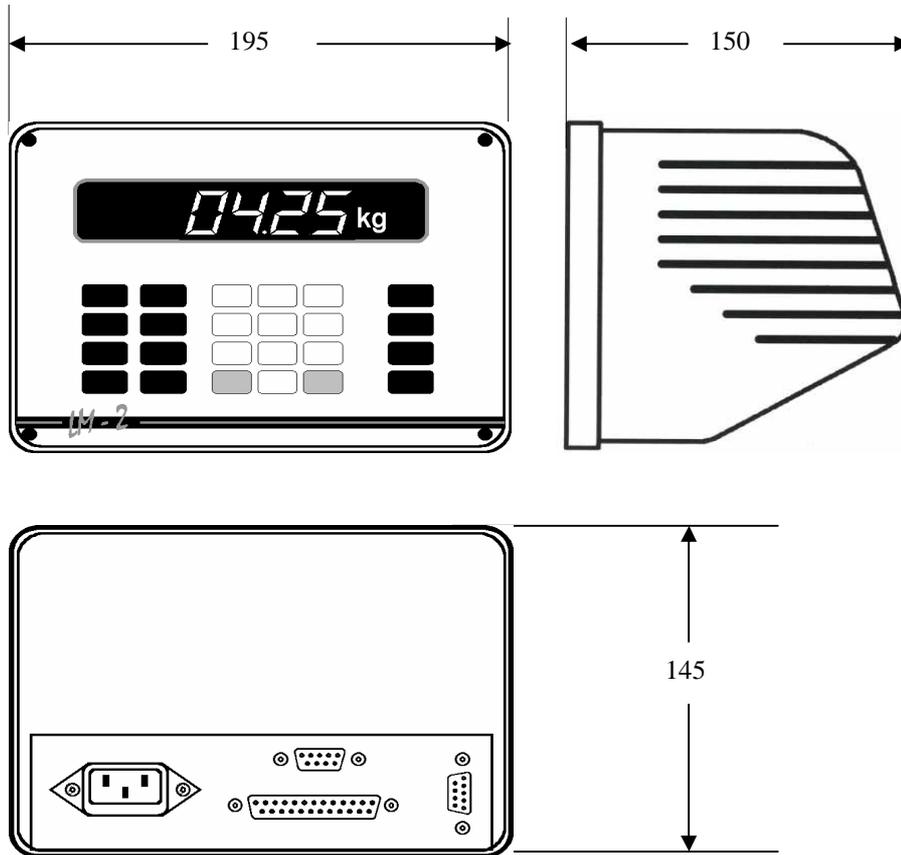
16.1. Errors related dosing process :

Codes	Description	Solution
E Gate	Bottom gate is open during dosing process. Error signal is produced.	-Close the bottom klape. -Control electrical connections .
E VLF	Ventil is not at proper position.	-Check the ventil position. -Control electrical connections .
E ZERO	Out of zero range	- Press Start key to acknowledge. -Provide zero condition -Check zero range
NO REC	No receipt defined	-Enter receipt
E STBL	Not stable when the start is given.	-Wait for the stability.
ERR APP	Application data error	-Check application parameters
E tol	Tolerance error	-Out of tolerance
E TRGT	Target error	-Target is not convenient
E PTIME	Dosing time is exceeded	- Press Start key to acknowledge - Check the reason for delay - Increase dosing period
E MX.CP	Over maximum target	- Weight is more than max. target
E TARE	Tare is out of tare tolerances	- Press Start key to acknowledge - Check tare and tare tolerances
E ZER H	Zero range is exceeded and zeroing is not possible.	-Clear the material affecting zero range -Calibrate the scale -Contact to your supplier
E XXX.X	Weighing is out of tolerances	- Press Start key to acknowledge -Press Reset to return to the beginning
ERR RCPT	Error in Receipt.	-Check the receipt -Check the materials in the receipt.
E STOP	Interupt	- Interrupt input is passive.
E REL.CR	Relay unit error	- No connection with relay unit.

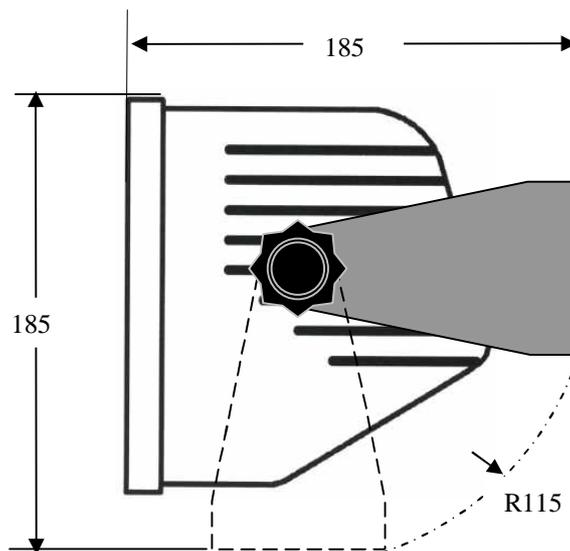
16.2 System errors :

Codes	Description	Solution
UndEr	Scale is under range	<ul style="list-style-type: none"> - Check the scale and load cell - Check calibration - Main board error
OvEr	Scale is over range	<ul style="list-style-type: none"> - Check the scale and load cell - Check calibration - Main board error
AdC oUt E AdC	Weight is out of range	<ul style="list-style-type: none"> - Check the scale and load cell - Check calibration - Main board error
- EEE	Power up zero cannot be executed. Auto zero range is out of range in minus	<ul style="list-style-type: none"> - Press enter key - Check the scale and load cell - Check calibration
EEE	Power up zero cannot be executed. Auto zero range is out of range in positive	<ul style="list-style-type: none"> - Press enter key - Check the scale and load cell - Check calibration
SSSS	Power up timer is in process	<ul style="list-style-type: none"> - Check the scale and load cell - Check calibration - Main board error
Err 1	NOVRAM error	- Contact to Baykon
Err 2	NOVRAM error	- Contact to Baykon
Err 3	RTC error	- Contact to Baykon
Err 4	RTC error	- Contact to Baykon
Err 11	Setup parameters checksum error	- Press print key. Reload or backup the parameters.
Err 12	ID memory checksum error	- Press print key to clear ID and totals.
Err 13	Total memory checksum error	- Press print key to clear total
Err 14	Calibration novram checksum error	- Press print key. Please check the scale calibration.
Err 15	Memory checksum error in standard 2 printout.	- Press print key to clear memory.
Err 16	Calibration parameters checksum error	- Press print key. If need be calibrate the scale.
Err 17	Header checksum error	- Press Print key. Reload header.
Err 18	Errors in dosing parameters	- Check parameters memory
Err 33	Calibration weight is not sufficient.	- Press Print key and increase calibration weight.
Err 34	Zero calibration error	- Press Print key. Check the scale and recalibrate it.
Err 35	Gain calibration error	<ul style="list-style-type: none"> - Press Print key. Recalibrate scale - Check load cell connections. - Check the scale. - Change main PCB.
Err 37	Scale is in motion	<ul style="list-style-type: none"> - Provide stable conditions during calibration. - Check ground connection.

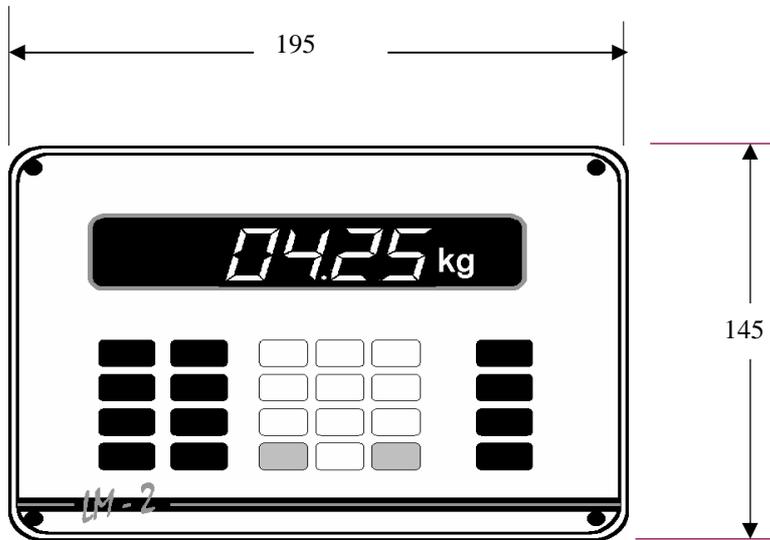
17. DIMENSIONS :



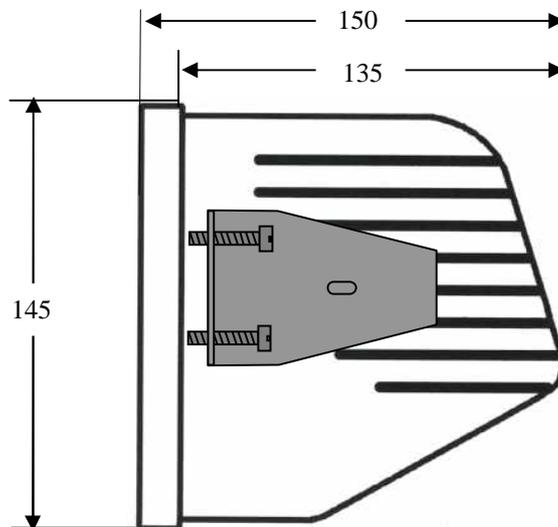
LM 4 external appearance and dimensions



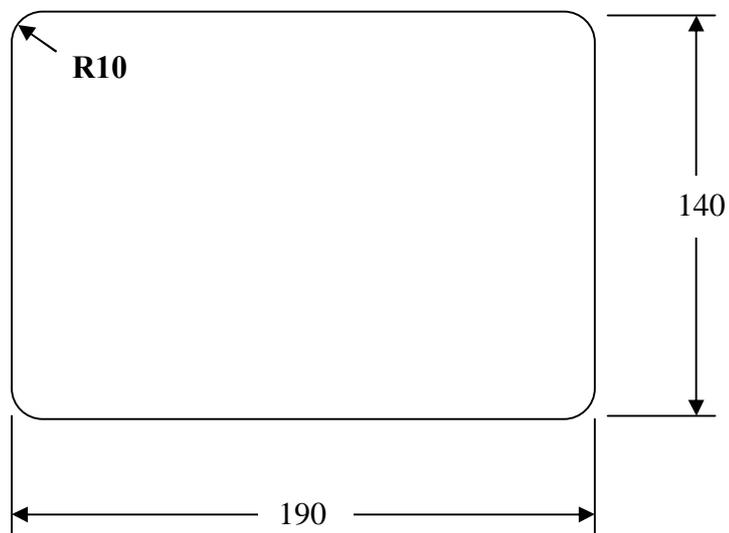
LM 4 wall installation



Panel type front appearance



Panel type side appearance and dimensions



Punch size for panel type installation

18. APPENDIXES

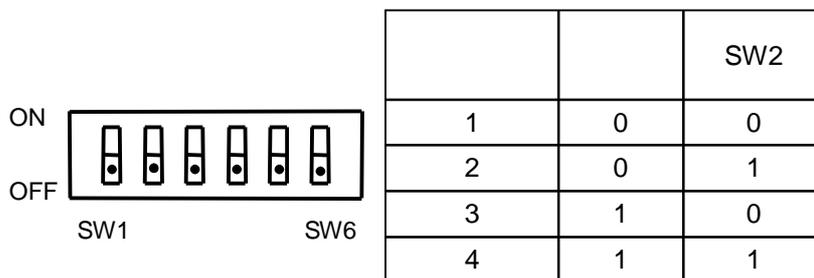
18.1 BR408 RELAY UNIT

BR408 relay unit has 4 Inputs and 8 Outputs which are controlled by LM 4 via serial port.

Addressing :

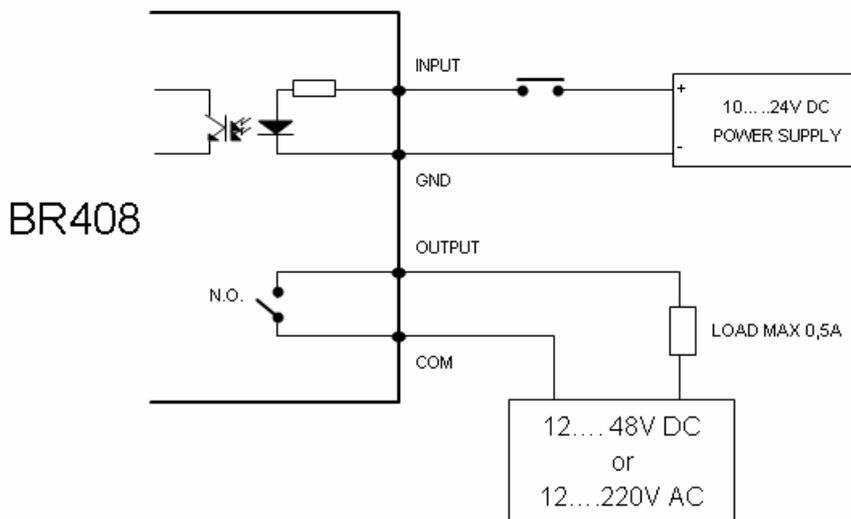
Up to 4 BR408 can be connected to LM 4 via common serial port. Below, you can find how to address each BR408 relay unit. The addressing table is indicated on the cover of BR408. Please unscrew this cover to Access the DIP switches to be used for addressing.

BR408 Relay Unit Address Selection



Inputs and Outputs :

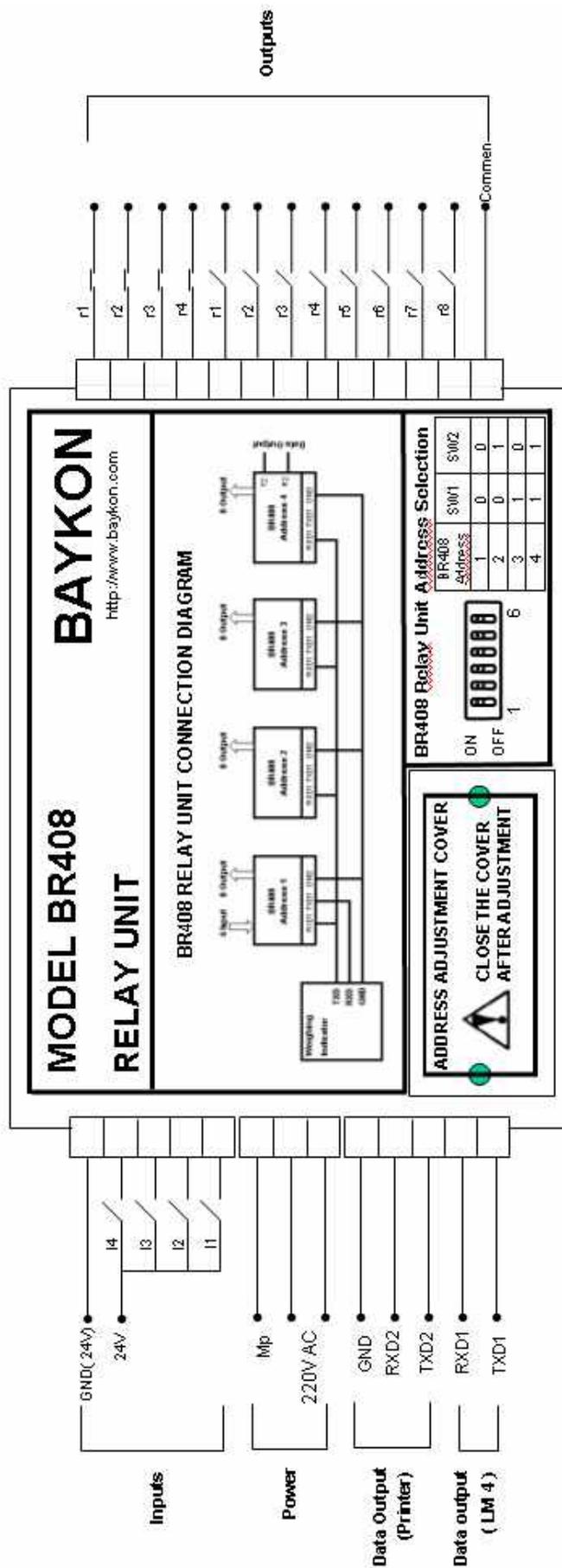
Inputs of BR408 are opto-isolated and the outputs are given as free relay contacts as indicated below:



TOP DRAWING AND CONNECTION :

BR408 top drawing and the connection can be found in the following.

BR408 RELAY UNIT CONNECTION



INPUTS : 10,.....24V DC / 50mA
 OUTPUTS : MAX 48V DC or 220V AC / 1A
 POWER SUPPLY : 220V , 50Hz

CAUTION
 CONNECT Mp TO PROPER GROUND.

18.2 STATUS BYTES OF CONTINUOUS DATA OUTPUT

Status Byte A			
Bit 0, 1 ve 2			
0	1	2	Decimal point
0	0	0	XXXXOO
1	0	0	XXXXXO
0	1	0	XXXXXX
1	1	0	XXXXX.X
0	0	1	XXXX.XX
1	0	1	XXX.XXX
0	1	1	XX.XXXX
1	1	1	X.XXXXX
Bit 3 ve 4			Increment size
3	4		
1	0	X 1	
0	1	X 2	
1	1	X 5	
Bit 5			Always =1
Bit 6			Always =1
Bit 7			x)

Status Byte B	
Bit 0	Gross=0 , Net=1
Bit 1	Weight positive= 0 , Weight negative=1
Bit 2	Over capacity = 1 ,
Bit 3	Stable =0 In motion=1
Bit 4	Kg=1
Bit 5	Always =1
Bit 6	Zeroed at power up = 1
Bit 7	X

Status Byte C	
Bit 0	Always = 0
Bit 1	Always = 0
Bit 2	Always = 0
Bit 3	Always = 0
Bit 4	Always = 1
Bit 5	Always = 1
Bit 6	Always = 0
Bit 7	X

CR = (D7,D6,D5,D4,D3,D2,D1,D0) = (X, 0, 0, 0, 1, 1, 0, 1)

CSUM = 0 - (STX + STATUS A + + CR)

18.3 WEIGHING PARAMETERS LIST

You can print weighing parameters by using U7 parameter. Please fill the following table.

Parameter	Factory default values	Your values	Notes
U00	0		
U02	0		
U03	1		
U11	1		
U20	0.4		
U21	1		
U22	1		
U50	2		
U52	2		
U56	1		
U58	0		
U59	0		
C11	10000		
C13	1		
C14	0.001		
C15	2.0		
C16	20.000		
1			
2			
3			
4			
5			
6			
7			
8			

18.4 CONFIGURATION PARAMETERS

You can write your configuration parameters in the following table.

Parameter	Factory default values	Your values	Notes
Mode	0		
v-g	0		
Int	0		
M.TRGT	0		
tol	0		
Tr. min	0		
Tr. max	0		
Zero	0		
SETT	0		
m. del	0		
f.str	0		
d.fin	0		
d.ven	0		
p.tim	0		

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