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USER ADJUSTMENT FOR MAGIC **AND MAGIC 20**





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USER ADJUSTMENT FOR MAGIC AND MAGIC 20

Date	Edition number	Object of the modification
02/10/2002	00	Original.
24/10/2002	01	Re-formatting.
19/11/2002	02	Addition of the 4_20mA cable connections.
11/12/2002	03	Correction of the inversion A+/A- and of the coefficient of the conversion kg/lb.
18/12/2002	04	Correction of the RS232 cabling on MAGIC 20.
18/12/2002	05	Software version: Version 022.
16/01/2003	06	Addition of the explication on "err ref" and of the summary.
07/02/2003	07	Correction of the parameter kg / lb.
18/09/2003	08	Format updating, addition of the management of the Profibus DP option board, and addition of the functions "M Tr" and "M Re".
28/05/2004	09	Commentary addition on the power of the I/O and on the management of the ETHERNET option board.
30/08/2004	10	Update of the page return.
30/07/2007	11	Addition of a descriptive of wiring of the measure.

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1. PRESENTATION OF THE EQUIPMENT.

1.1. <u>Technical characteristics.</u>

Maximal number of scale divisions (legal for trade)	: 5000 (if the unit used is the kg).
	: 10 000 (if the unit used is the lb).
Warning: If you use both units at the same time you	are limited at 4536 in kg and at 10 000 in lb.
Indicator's sensitivity	: 0.75 μV.
Load cells' excitation voltage	: 5V alternative square wave.

Load cells' excitation voltage Number of measurements / second Minimum load cell drive (analog load cells) Maximum number of digital load cells

: from 10 to 90m/sec.

- ≥ 58 ohms. (6 load cells of 350 Ω)
- : 6.

Zero displayed at the 1/4 of the scale division.

Conversational numeric adjustment by the front panel.

DC voltage supply: from 9.6Vdc to 25Vdc maximum.

Power consumption: 100mA minimum to 400mA maximum under 12V, according to the configuration. Internal clock and memory backed up by battery.

<u>MAGIC :</u>

6 digits weight display of 14 mm. Keypad: - 3 metrological keys, - 3 application keys. <u>MAGIC 20 :</u> 6 digits weight display of 20 mm. . Keypad: - 3 metrological keys, - 17 application keys.

1.2. <u>The peripherals.</u>

The indicators "MAGIC", "MAGIC 20" offer in standard version :

* 1 serial link RS232 set on CO1 (COM1).

* 1 input for analog load cell(s), 6 wires, on M1.

In option :

- * 1 serial link on CO2 : (COM2)
 - RS232.
 - RS485. (2 wires or 4 wires)
 - 0-10V analog output. (Optically isolated)
 - 4 -20 mA analog output. (Optically isolated)
 - Current loop. (Active or passive)
 - ProfiBus DP, For a weight transmission and reception of the commands SAT, ZERO, ...(Optically isolated)
 - ETHERNET, for the transmission of the GROSS / TARE / NET weight and the reception of the basic commands.

* 4 inputs and 4 outputs :



4 dry contact relays free of all potential. (With common). <u>Maximum electrical characteristics (*)</u>: V = 48V / I = 500mA.



4 logic inputs **no external power supply required**^(*). (Maximum length of the cable : 3 m)

(*) ATTENTION : If you do not take into account the last two instructions, this may cause the breakdown of the indicator. * An input for digital load cells:

M1: digital load cell(s). (Utilization of the MASTER CAN bus)

<u>Remarks :</u>

- Only one cable must be connected to M1. Load cells are wired up in parallel separately in a junction box.
- Depending of the position of the jumpers (ST4 to ST7), the **M1** connector allows the connection of the MASTER-K digital load cells or the analog load cells.
- The strand of the analog load cell's cable must be obligatory connected to the indicator's ground.

2. THE FRONT PANEL.

2.1. <u>Displays and LEDs.</u>

2.1.1. <u>MAGIC.</u>



Remarks:

- The LEDs kg or lb also indicate if the weight is immobile: LED flashing LED steady - The LEDs kg or lb turn off to show that the display indicates a data
- \rightarrow weight unstable.
- \rightarrow weight stable.
- The LEDs **kg** or **lb** turn off to show that the display indicates a data. (And not a weight: DATA)
- Conversion from kilogram to pound: 1 kg = 2.204 lb,1 lb = 0.454 kg.

2.1.2. <u>MAGIC 20.</u>



Remarks:

- The LEDs \mathbf{kg} or \mathbf{lb} also indicate if the weight is immobile: LED flashing
 - LED steady
- \rightarrow weight unstable.
- \rightarrow weight stable.
- The LEDs **kg** or **lb** turn off to show that the display indicates a data. (And not a weight: DATA)
- Conversion from kilogram to pound: 1 kg = 2.204 lb,

$$1 \text{ lb} = 0.454 \text{ kg}.$$

2.2. Keypad.

2.2.1. <u>MAGIC.</u>

Metrological Keys:



Application Keys:



To move in the different menus and to seize data, we have six keys. (As follows)

	•0•	B/G/N +	$\qquad \qquad $	$\bigcirc \\ \leftarrow$	SET UP kg/lb	
IN THE FUNCTIONS OR MENUS	Not used.	Not used.	Previous function/menu .	Next Function / menu.	Not used.	Access to the function/menu. (ENTER)
IN THE SEIZURES	Decreases the flashing digit by one unit.	Increases the flashing digit by one unit.	Resets the value to seize, and in case of a signed value used to change the sign also.	Shift one digit to the left.	Exit key. (ESC).	Validates an entry.

Remark:

If the "*MAGIC*" indicator has been adjusted to operate with the two units (kg/lb : cf. 4.1. page 14), the commutation of a unit to the other is made by pushing <u>simultaneously</u> the two following keys :



2.2.2. MAGIC 20.



- "Print" Key, not used in adjustment mode.
- "Validation" key used to validate a data displayed on the indicator. (ENTER) Access to the function /menu displayed.
- "Programmable Tare" Key, not used in adjustment mode.
 - "Tare" key, (enter a tare), not used in adjustment mode.
 - "Gross / Net" Key, not used in adjustment mode.
 - "Zero" Key, not used in adjustment mode.

"kg/lb" Key, if the indicator "*MAGIC 20*" has been adjusted to operate with the two units (kg/lb : cf. 4.1. page 14), the commutation of a unit to the other is made by pushing this key.

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Key



					Cable	Connections			
		1	2	3	4	5	6	7	8
CO1	RS232	Тх	Rx	DTR	0V				
CO2	RS232	DTR	Rx	Тх	0V_ISO	<i>N.C.</i>	N.C.	N.C.	N.C.
	RS485 4 wires	N.C.	N.C.	N.C.	0V_ISO	Tx+	Rx+	Tx-	Rx-
	RS485 2 wires	N.C.	N.C.	N.C.	0V_ISO	N.C.	Tx/Rx+	N.C.	Tx/Rx-
	0-10V	N.C.	10V	N.C.	0V_ISO	N.C.	N.C.	N.C.	N.C.
	4-20mA	20mA	N.C.	N.C.	0V_ISO	N.C.	N.C.	N.C.	N.C.
	BDC	N.C.	N.C.	N.C.	0V_ISO	Tx+	Rx+	Tx-	Rx-
	Profibus DP	Ground	N.C.	A_Line	RTS	0V_Iso	5V_Iso	N.C.	B_Line
		(Shield)							
	ETHERNET ⁽¹⁾	<i>N.C.</i>	N.C.	N.C.	0V_ISO	Tx+	Rx+	Tx-	Rx-
CO3	Outputs	01	O2	03	O 4	Common			
CO4	Inputs	I1	I2	I3	I4	Common			
CO5	Power supply	$+V_{DC}$	Earth	0 V					
M1	Analog load	М-	M+	R-	R+	A-	A+	Ground	
	cell	(-Signal)	(+Signal)	(- Sense)	(+Sense)	(- Excitation)	(+Excitation)	(Shield)	
	Digital load cell	N.C.	N.C.	Can_L	Can_H	+12V	0 V	Ground	
								(Shield)	

(1) : Please look for the documentation of the ETHERNET option board for more explanation on the cabling.



Cable connections of the DB9 connector:

			BROCHE												
		1	2	3	4	5	6	7	8	9					
CO1	RS232	Ground	Rx	Тх	N.C.	N.C.	DTR	0V	N.C.	N.C.					
M1	Analog	Ground	N.C.	А-	М-	A+	M+	R-	R+	N.C.					
	load cell			(-Excitation)	(- Signal)	(+Excitation)	(+Signal)	(- Sense)	(+Sense)						
	Digital	Ground	N.C.	+12V	N.C.	0 V	N.C.	CAN_L	CAN_H	N.C.					
	load cell							_	_						

Remark:

For the CO2/CO3/CO4 connections, see the "cable connections" in 3.1 in page 10.

3.3. <u>Wiring of the analogical measure.</u>



4. ADJUSTMENT MODE.

A qualified technician must carry out this operation.

Switch from normal mode to adjustment mode:

The switching from a mode to the other is made due to the adjustment switch (I1) which is located at the back of "*MAGIC*" indicator (cf. 3. page 10), and inside the indicator of the "*MAGIC* 20". (cf. 7. page 23)

- Turn off the indicator, then commute the adjustment switch, turn on the indicator. The indicator makes the starting stages.
- Then the message conF- will be displayed.
- The following menu will be available :



Remark: To move inside the menu:

[Magic keys	Magic 20 keys	Effects
Ē	Ť	R	Move to the previous function / menu.
	() U	(1)	Move to the next function / menu.

Remarks:

- The red LED near the adjustment switch indicates the mode in progress: On \rightarrow normal mode.

Off \rightarrow adjustment mode.

- Once inside a function where there is a seizure to do, the seizure will be displayed in alternation with its title.
- To show you that you made the tour of the menu or the function, the indicator displays the following message before coming back to the main menu:

<u>Warning: If there is a power cut during the adjustment mode before the save is</u> <u>made, all the setting parameters will be lost.</u>

4.1.Metrological parameters and configuration of the MAGIC/MAGIC 20.

In this function, you must enter all of the following parameters:

(To pass from a parameter to the other, you musto validate the parameter by for the "*MAGIC*" and for the "*MAGIC 20*")



: X

- Choice of the unit.
 - 0 : the "kg" is used as the weight unit in the adjustment and the normal modes (5000 scale divisions max).
 - 1 : the "kg" is used as the weight unit in the adjustment and the normal modes, with the possibility to pass in "lb" calculated in normal mode. (4536 scale divisions max for kg and 10 000 scale divisions max for lb).
 - 2 : the "lb" is used as the weight unit in the adjustment and the normal modes. (10000 scale divisions max).
 - 3 : the "lb" is used as the weight unit in the adjustment and the normal modes, with the possibility to pass in "kg" calculated in normal mode. (4536 scale divisions max for kg and 10 000 scale divisions max for lb)

: XXXXXX

Range of the measurement on six digits, from 1 to 250 000 kg.



: XXX.XXX

Scale division of the measurement (multiple of 1, 2, 5) on six digits, with three digits after the digital point, from 0.001 to 50 kg.



: X

Input Range, it is possible to modify the voltage range of the analog measurement chain.

- 0 : Range 20 mV. (By default)
- 1 : Range 10 mV. (Low pull or weak tare)
- 2 : Range 20 mV. (High pull or important tare)

: XX

Number of measurements per second, 10 to 90 :

- from 10 to 14 = 10 measurements per second.
- from 15 to 24 = 20 measurements per second.
- from 25 to 34 = 30 measurements per second.
- ...
- from 85 to 90 = 90 measurements per second.



: X.X

According to the conditions of the installation of the scale it will be necessary to adjust the zone of immobility (motion detection). (from 0.5 to 3.0 scale divisions)



: XX

Gives the speed to obtain the immobility. (5 to 99: necessary number of measurements to get the immobility, minimum Value = Number of measurements per second / 2)

Example : with 50 measurements/sec, the minimum value of this parameter is 25.



: XX

Value of the filter, 00 to 99 :

- 00 = filtering not activated.
- 99 = maximum filtering.



: X

If the NET weighing is not authorized, the keys of SAT and G/N are not activated. (Display blocked in gross)

: X

: X

- 0 = no.

- 1 = yes.

Validation or no of the zero-tracking.

- 0 = no.
- 1 = yes.

Resets the scale when the indicator starts up within +/-10% of the maximal range.

- 0 = no.
- 1 = yes.

: X

: X

If the indicator is designed for a "regulated mode" use (commercial transactions..., the device has in this case a marking of conformity CE or UL) this parameter must be set to 1.

In the contrary case, the securities are not activated. (Maximum number of scale divisions and semiautomatic zero setting zone)

- 0 = no.
- 1 = yes.



Choice of the type of load cells (or sensors):

- 0 = analog load cell(s).
- 1 = MASTER-K digital load cell(s).



: XX

This data is only important if the type of load cell is digital, in this case the number of load cells declared must be exact. (From 1 to 6).

4.2. Zero setting.

Before validating this menu check the load cell connections, the state of the load support (scale, weighbridge, hopper, etc.).

With the load support empty and clean, you can validate the zero-setting.

The time for this operation depends on the time required to obtain a stable measurement. Consequently, there must be no vibration and calm weather for outdoor weighbridges.

4.3. Gain setting.

Before validating this menu, you must have set the zero.

Place the standard masses on the load support then validate the gain-setting. Enter the value of the standard masses by using the keypad, then validate.

The duration of this operation depends on the time required to obtain a stable measurement. Consequently, there must be no vibration.... and calm weather for outdoor weighbridges.

Remarks:

- Good quality settings imply standard masses of a value near to the max range of the weighbridge.
- This operation can be repeated several times without unloading the masses.

4.4. End of slope correction (Fine correction).

This menu is used to make a small correction on the slope (System gain, fine correction) It allows also compensating the variation of the «g» factor according to the location of use of the complete instrument. (g = gravity).

When checking the weighbridge, if you notice a slight delay or advance at full load you can correct the error due to this function.

The type of load cell used is analog :

Validate the menu, enter the value of the correction in scale divisions, validate again. Check the result of the correction by displaying the weight display.

The type of load cell used is digital:



Validate the menu, the led display indicates: Give the number of the load cell on which you want to do the adjustment. Enter the value of the correction in scale divisions, and validate again. Check the result of the correction by displaying the weight display.(cf. 4.9. page 18)

Remarks:

- If the negative sign is displayed in front of the data, the correction will be negative. There is no sign for a positive correction.



When we have a digital load cell, if the digital load cell number chosen is" 00", then the adjustment will take place for the totality of the digital load cells, which is equivalent to the thin adjustment of the end of slope with analog load cells.

4.5. End of the adjustment and saving the settings.

Validate this menu to leave the adjustment mode and to save the parameters and the adjustment values.

During the saving the led display indicates: **SHUE C** . This operation takes several seconds.

Then the message : **DF** is displayed to indicate that you must put back the adjustment switch in its initial position. (normal mode position, red LED on)

4.6. Transmission of the Magic parameters.

This menu allows to save, in a text file (.TXT), all the Magic parameters (metrological, configuration, adjustment, application) on a computer.

For this you must:

- Connect the computer (on Com1) with the Magic (on Com1) with a PC/Magic link cable.

- Run the program HyperTerminal. (Path of Hyperterm.exe: "C:\Program

Files\Accessories\HyperTerminal\HYPERTRM.EXE").

- Name the connection and validate.

- Then in the header "Connect using" choose "Send to Com1".

- Configure the connection as follows: 9600 Bauds, no parity, one stop bit, no flow control.

- When you return to the main screen, you must go to "Transfer" then to " Capture text", define the name of the saved file and validate "Start", the computer will wait for the information.

- On the Magic, you must validate the menu "-M Tr-".

- During the transmission, the saving is displayed on the PC screen and the Magic displays "-----", then return to the main menu.

- To finish the saving, you must go, on the PC, to "Transfer" then to "Capture text" and "Stop".

4.7. Reception of the Magic parameters.

This menu allows to restore, in a text file (.TXT), all the Magic parameters (metrological, configuration, adjustment, application) saved before on a computer

For this you must:

- Connect the computer (on Com1) with the Magic (on Com1) with a PC/Magic link cable.

- Run the program HyperTerminal. (Path of Hyperterm.exe: "C:\Program

Files\Accessories\HyperTerminal\HYPERTRM.EXE").

- Name the connection and validate. (TERMINAL.MAG)

- Then in the header "Connect using" choose "Send to Com1".

- Configure the connection as follows: 9600 Bauds, no parity, one stop bit, no flow control.

- On the Magic, you must validate the menu "-M Re-". The Magic displays "-----"; He is waiting the information.

- On the PC, go to "Transfer" then to "Send the text file", select the saved file to be transferred and validate

"Open", the computer transmits the information.

- Then return to the main menu.

4.8. Change of the digital load cell number.

This menu is only proposed if LOAD CELL TYPE = **digital.** (cf. 4.1. page 14)

When changing a load cell, give the CAN station number of the old load cell to the new load cell.

To do this, validate the function. Give the CAN station number of the new load cell (53), validate. Then give the CAN number of the load cell to be replaced (number from 1 to 6), validate.

If the load cell number is not 53 (load cell already used), isolate the load cell by disconnecting the wires CAN_H and CAN_L of the other load cells.

Give the CAN station number of the load cell (00), validate.

Then give the CAN number of the defective load cell (number from 1 to 6), validate. Reconnect all the load cells for test.

Remarks:

- On leaving the factory the digital load cells are configured with the value 53.
- On the start-up of the indicator, you can visualize the number of load cells detected by the indicator.

4.9. Display of the converter points of a digital load cell.

This menu is only proposed if the type of load cell is digital. (cf. 4.1. page 14)

While validating this menu, you must enter the CAN station number of the load cell to display its converter points. This menu is used only to verify if a load cell is operating properly or to know the distribution of the loads on the load receiver.

4.10. Display of the measured weight.

In adjustment mode, it is possible to display the measured weight under three forms :

- In number of converter points,
- In number of measured scale divisions at a precision of 1/10,
- Or in the selected unit. (kg, lb)

For this :

- With a "MAGIC" when you are in the main menu of the adjustment mode, press on the key :

Then, to choose the display format, you must press on the key :

Every time you press on this key, it changes the format.

To leave this display and to return to the adjustment menu, simply press on the key :

- With a "MAGIC 20" when you are in the main menu of the adjustment mode, press on the key :

Then, to choose the display format, you must press on the key :

Every time you press on this key, it changes the format.

To leave this display and to return to the adjustment menu, simply press on the key :

CE

5. ERROR MESSAGES.





6. BREAKDOWN SERVICE.

The indicator displays the following message : •

Verify the indicator's supply voltage, it must be between 9.6V and 25V, position the jumper correctly.

The indicator displays the following message : •

The range of the converter's voltage doesn't suit the signal provided by the weighing cell, modify the range of the converter's voltage or unload the weighing cell.

The indicator displays the following message :

The range of the converter's voltage doesn't suit the signal provided by the weighing cell, modify the range of the converter's voltage or load the weighing cell or check the cables' connection (M+/M)-.

The indicator displays the following message : •

Restart the indicator, and set the adjustment again.

The indicator displays the following message :

The analog load cell is not connected correctly, verify that the reversions of the supply (R+/R-) are connected correctly.

The indicator displays the following message

Restart the indicator, and set the adjustment again.

The indicator displays the following message :

Check if the CAN Bus is working properly. (Example : bad connection, positioning of the ST4 to ST7 jumpers in digital load cell's configuration, put the terminal resistor of 120 ohms if necessary)

The indicator displays the following message :

The adjustment of the digital load cells is not valid, please set it again.

The indicator displays one of the following messages :

The value of the scale division entered was not a multiple of 10 and 1 or 2 or 5. Enter a new value for the scale division. (1, 2, 5, 10, 20, 50, 100...)

The indicator displays the following message :

The indicator functions in regulated mode, and the maximum number of scale divisions is exceeded. Enter new values for the maximum range and for the scale division.

(Number of scale divisions = max. Range / scale division)









• The indicator displays the following message : **E**

The indicator operates in regulated mode, and the number of the immobility value configured is incorrect. Enter a new value that must be greater than or equal to the number of measurements per second divided by two. *Example* : If the number of measurements per second equal 30, then this parameter will be at the minimum equal 15)

If your problems persist, contact your nearest retailer or the technical support of the ARPEGE MASTER-K Company.

7. APPENDIX.





Position of the jumpers for the supply voltage :



The red led near the adjustment switch indicates the mode in progress:

- On \rightarrow normal mode.
- Off \rightarrow adjustment mode.

Х

x y

Y

Z

U

u

vllw

R	Ь	٢	d	E	F	\boldsymbol{b}	Η	;	J	h	Ľ	[]	n	D	P	9	r	5	\vdash
Α	В	С	D	Е	F	G	Η	Ι	J	K	L	Μ	N	0	Р	Q	R	S	Т
a	b	c	d	e	f	g	h	i	j	k	1	m	n	0	p	q	r	s	t
IJ	Ľ	Н	~	Ч			[]	2	3	Ч	5	6	7	8	9				

 Z
 0
 1
 2
 3
 4
 5
 6
 7

8 9

- Pseudo-alphanumeric display of the "MAGIC" and "MAGIC 20" indicators:





ARPEGE MASTERK