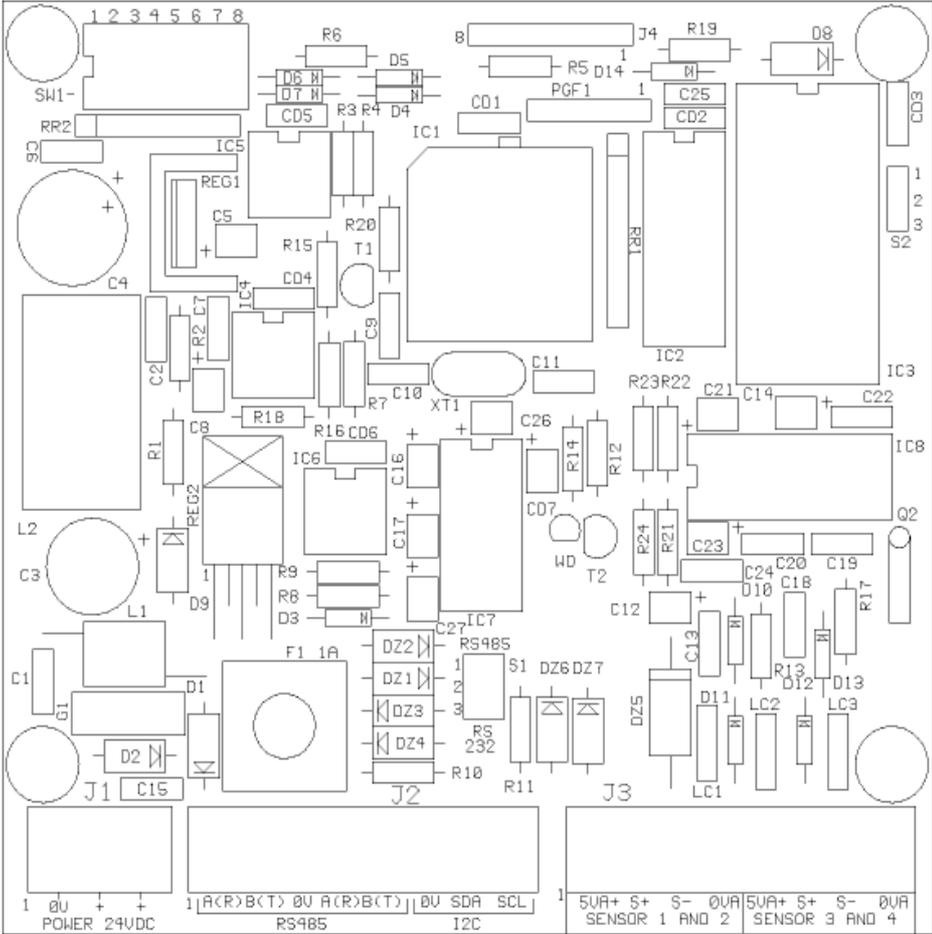


DF220 Manual



WEIGHING DEVICES

2 weighing devices are available :

-DF190 ,ref 049112

-DF220 , ref 049101

DF190 is a basic system designed to be connected to a computer . It consists of a waterproof plastic box containing a main electronic board (CPUPES2). DF220 is a DF190 with an extra display board with keys allowing this device to be configured and used without computer.

FEATURES CPUPES2 BOARD

supply voltage : 12 to 30 VDC, 200 mA.

Microcontroller 89C51RD2 ,with memory on chip (64 kbyte flash, 1kbyte ram)

High precision Sigma -delta converter (+/- 512 000 points)

15 conversions per second.

2 connectors of 4 terminals to connect 4 load cells.

3 terminals for the RS485 serial link.

3 terminal for I2C communication.

blinking led when the board operates

FEATURES AFFICH6 BOARD (DF220 ONLY)

supply voltage from CPUPES2: 12 VDC, 80mA.

5 led digits display .

3 keys .

entirely controlled by CPUPES2 .

ADDRESS SELECTION

The 3 following switches are read at power on to calculate the address of the weighing device on the RS485 serial link.

Switch1	Switch2	Switch3	Switch4	Switch5	address
On	On	On	On	On	1(*)
Off	On	On	On	On	2
On	Off	On	On	On	3

(*) : standard value when one weighing device is used in a plan.

Switch 4 and Switch 5 must be "ON" for normal use.

FACTORY CONFIGURATION

Switch 5 must be "ON" for normal use.

Switch 5 allows to set the following factory values :

-coefficient A : 1.000

-size : 1

-grade : 1

-filter : 8

setting the factory configuration:

- power off the board
- move switch5 "off".
- power on the board.
- wait for 5 seconds.
- power off the board.
- move switch5 "on".

Theoretically , setting a « coeff A » value depending of the total load cells capacity is enough to calibrate the complete weighing device if the accuracy of load cells sensivity is good . How ever in all cases , it is important to achieve an experimental calibration to prevent from any failure of elements of the weighing device (bad connections , mechanicals problems ...) .

FACTORY CONVERTER ADJUSTMENT

Switch 5 must be "ON" for normal use.

Switch 5 is also used in factory to calibrate the A/D converter . This calibration is done in factory at the end of the manufacturing process.

A/D converter adjustment:

- power off the board
- connect the ACEMO LOAD CELLS SIMULATOR on the board.
- connect the board to the flexmix computer and select ADJUSTMENT/WEIGHING
- move switch 5 "on".
- power on the board.
- wait for about 5 seconds until led on the weighing board blinks quickly .
- set 0000 on the simulator and wait for the stability on the flexmix and check the "gross value " is between -2000 and +2000.
- move switch 5 "off".
- led on the weighing board blinks slowly.
- set 3000 on the simulator and wait for the stability on the flexmix and check the "gross value " is between 69000 and 71000.
- move switch 5 "on".
- led on the weighing board is lighted on during 3 seconds , and then blinks quickly.
- end of the adjustment.

WEIGHING SIMULATION

Switch 4 must be "ON" for normal use.

When switch 4 is off at power on , Datafarm 190 ,220 is set in simulation mode . In that way weighing value is increasing or decreasing at a rate depending of the resistors connected instead of the load cells . (see weighingtest_1 board manual)

USING KEYBOARD AND DISPLAY (DF220)

To avoid mistakes , commun data are accessed from user mode , and technician data from configuration mode. To enter configuration a password must be validated from user mode .

At power on , user mode is automatically selected.

key + , to increase a value .

key - , to decrease a value.

Key P , many functions:

- short press to select the parameter for reading
- long press to enter the programming mode for writing

weighing value is the main value and it is continuously displayed. For others parameters , the designation and the value blink.

reading a data :

Each short press on “P” select next parameter . 3 parameters can be displayed:

- 1) weighing value , read only.
- 2) tare , weighing value that can be modify .
- 3) configuration to acces to the configuration parameters. Value 38 must be validated to enter configuration mode

Writing a data :

-select desired data using short press on “P”, the designation and the associated data blink.

-press on “P” until the designation is displayed without blinking.

-value is now blinking , modify it using “+” and “-“.

-to quit and validate , press on “P” until blinking stops.

-to quit without validate , a short press on “P”.

From configuration mode , pressing at the same time on “+” and “-“ comes back to the main display of the user mode.(weighing value)

USER MODE (DATAFARM 220)

At power on , Datafarm 220 displays “8.8.8.8.”for few seconds and the version number. After this initialization duration , weighing values are available on the serial link and on the local display.

Using keyboard the following functions can be achieved:

-main weighing value . It is displayed without blinking.

-local weighing value . From main weighing value , a press on “-“ reset the display . Every modification of the weighing value is then displayed and blinks . A press on “+” comes back to main weighing value.

-tare . User can modify the main weighing value according to the contents of the hopper or of the tank.

-confi_ When ‘38’ is entered , datafarm220 switches to the configuration mode (only for technician).

When an error is detected , error number is displayed and transmitted to serial link.

ERR.4	Converter overrange
ERR.5	Internal converter problem
ERR.6	Load cells overrange
ERR.7	No signals from converter

CONFIGURATION MODE (DATAFARM 220)

This mode is accessed by entering value “38” for parameter “confi” from user mode . Then , technician can modify the configuration parameters that are described in next chapter . It is also possible to do it from Flexmix (main menu/adjustment/weight). Pressing “+” and “-“ at the same moment switches to user mode.

DESCRIPTION OF THE CONFIGURATION PARAMETERS

Calibration has to be achieved only by technician.

For the following it is important to know the formula :

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

gross value : this value is the result of a filtering calculation from the analogic to digital converter(ADC).

weight : value en kg, calculated according to the configuration data. When it is modified , coefficient B is internally modified. $\text{coefB} = \text{gross value} * \text{coefA} - \text{weight}$.

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

- load cell sensivity(1mv/v,1.5mv/v,2mv/v).
- load cell capacity.
- number of load cells.
- converter gain.

To get a high accuracy ,it has to be adjusted ²experimentally for each plant. Standard value from a table can also be used, but the accuracy will be lower ,according to the theoretical accuracy of every element of the weighing device. About 0.5 % can be get in that case.

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

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

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

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

The weight always contains 5 digits, and the size set the comma position

- size = 1 , weight value is written as : xxxxx kg -> 1 unit = 1 kg
- size = 0.1 , weight value is written as : xxxx.x kg -> 1 unit = 0.1 kg
- size = 0.01 , weight value is written as : xxx.xx kg -> 1 unit = 0.01 kg
- size = 0.001 , weight value is written as : xx.xxx kg -> 1 unit = 0.001 kg

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

Standard value : 1

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

Standard value : 8

