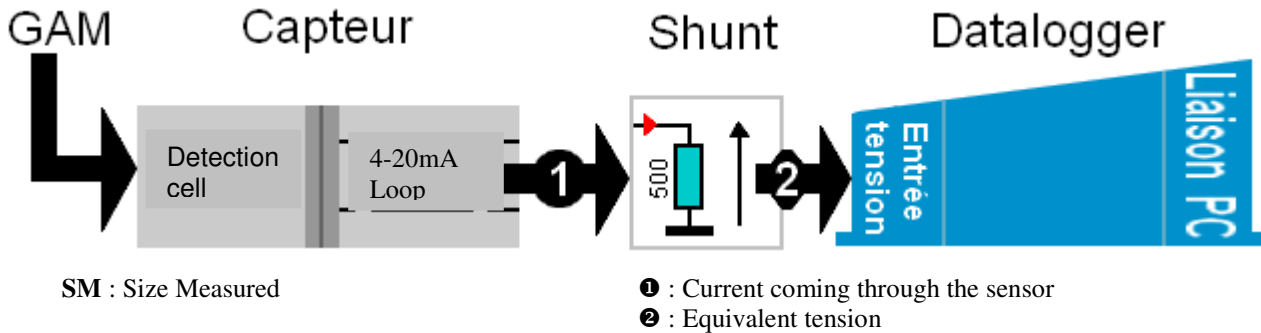



Some sensors convert their input into a low intensity current, which ranges linearly from 4 to 20mA. The SEFRAM dataloggers have just one voltage input, a shunt must be used to convert this current into an equivalent voltage.

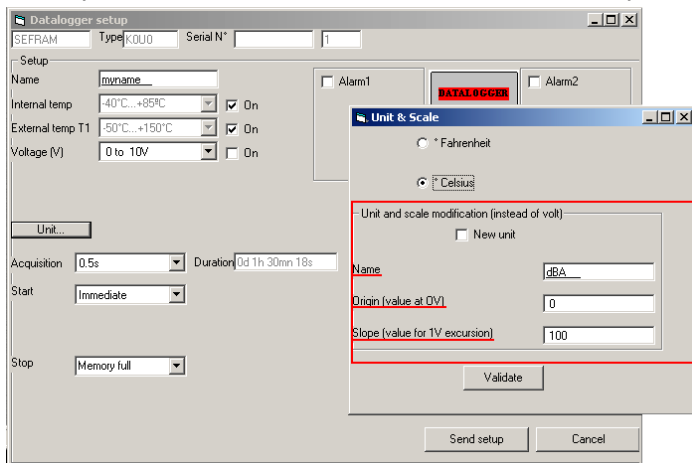
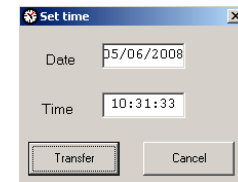
The bloc-diagram below illustrates the operation :



When the datalogger is connected to the computer, the voltage from the shunt (stored in the memory) is transmitted to software TR1500, which enables to convert this voltage into the initial value, this process is defined as unit change.

To set the software proceed as follow :

1. Connect the interface USB-IRDA and put the datalogger close to the interface.
2. Turn the TR1500 on and press  to detect the datalogger.
3. Once it is connected, update the time. Confirm by pressing **Transfer**.
4. Press the key **CONF** then **UNITS** in the configuration window. . This appears on the screen (*The framed section is the one we are interested in*) :



5. Setting the red parameters.

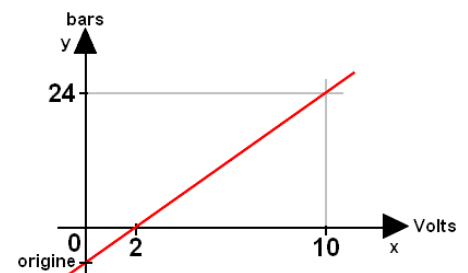
Name : the name of the parameter we want to measure
Origin : The value of the parameter when the datalogger gives a measured voltage of 0 volt.
Slope : the coefficient used to convert the voltage measured by the datalogger into the initial parameter.

Example :

A pressure sensor provides a 4-20 mA output, 4 mA corresponds to 0 bar and 20 mA to 24 bars. As explained previously, this current has to be converted into voltage to enable the datalogger to measure it. The shunt resistor from the datalogger (see figure 1) is 500 Ohms, we use Ohm's law $U=R*I$ (with U : Voltage, R : Resistor, I : Current) :

$$\begin{aligned} \text{For : } I = 4 \text{ mA} &\rightarrow U = 2 \text{ V} \\ I = 20 \text{ mA} &\rightarrow U = 10 \text{ V} \\ 0 \text{ bars} &\rightarrow 2 \text{ V} \\ 24 \text{ bars} &\rightarrow 10 \text{ V} \\ y \text{ bars} &\rightarrow x \text{ V} \end{aligned}$$

The match pressure - voltage :



- Slope calculation :

We see figure 2 that the slope is a straight line, the equation is $y = ax + b$ (with y : pressure, a : slope, x : voltage, b : origin).

$$a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{pression2} - \text{pression1}}{\text{tension2} - \text{tension1}} = \frac{24 - 0}{10 - 2} = \frac{24}{8} = 3$$

- Origin calculation :




In the equation $y = ax + b$ we know the value a (the slope), y (some pressure) and x (the voltage corresponding to this pressure), now b has to be determined (the origin) :

$$b = y - ax = 24 - (3 \times 10) = -6$$

6. Tick the box **New unit**, run these values in the software and press **Validate**.

In the case of a clamp :

The accessories clamps SP 205, SP 215 and SP 240 can be connected to the dataloggers. These clamps measure the alternating current and provide a DC voltage, which is the image of this current image. Here are the value of slope, the origin and the unit to enter in the software.

	SP 205 1 VDC/ 10 A~ 	SP 215 1 VDC/ 100 A~ 	SP 240 1 mVDC/ 1 A~ 
Unit name	A (Amp)	A (Amp)	A (Amp)
Origin	0	0	0
Slope	10	100	1000

Product link : http://www.sefram.com/www/NP_quick_search.asp?st=1500