Climate Chamber Control and Fine Tuning. Marine Seismometer Oscillator Applications

Climate chambers are instruments designed to perform tests and functionality and behaviour verifications of any electronic or similar device in controlled temperature and relative humidity conditions. With the objective of facilitating its control to the operator and improving its use while at the same time increasing its possibilities, we have designed and built a connection interface between the climate chamber *VOSCHT VC 4060* situated in a laboratory at the Vilanova i la Geltrú Technology Centre and a PC. This chamber works in a range of temperatures between –40ºC and 180ºC with a variation velocity of 3K/min in heating state and 2.5 K/min in cooling state and in a range of 10% to 99% relative humidity.

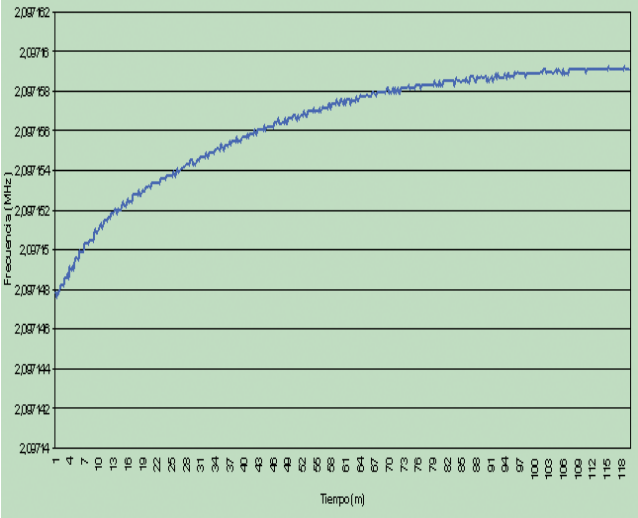

Fig1. Frequency change of the oscillator in function of time at a constast temperature of 30ºC. The device stability (2.097MHz) is achieved after 333 minutes.

The control system was designed in the system development and virtual instrumentation environment *LabWindows/CVI*. This application allows us to perform long term climate tests with different patterns of temperature and relative humidity change as well as monitoring in real time the evolution inside the chamber. The designed software can be used to control different measurement instruments (multimetres, oscilloscopes, etc.) and also other climate variables in different environments (greenhouse, etc.). It has been used to study the behaviour of a high precision oscillator under controlled climate conditions (fig 1). This device is part of a data acquisition system of a marine seismometer whose stability with temperature is fundamental. Its ramarkable stability in the temperature changes, typical in the marine environment has been proved.

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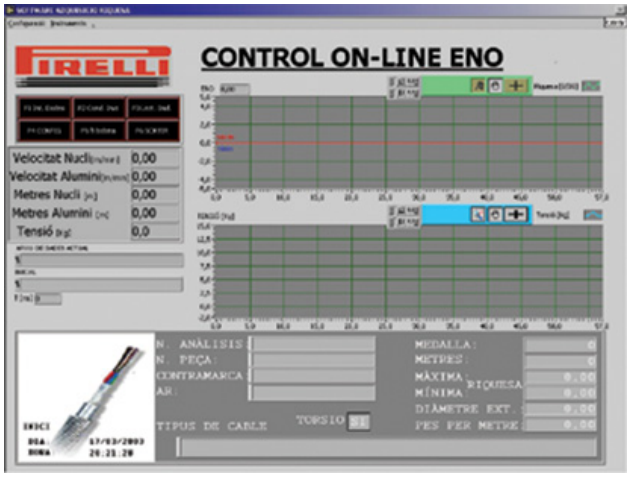
On-line Monitoring of the Differential Lenght Between Nucleus and Coating in Optical Conductor Manufacturing

In the manufacturing process of telecommunications cable with optic nucleus, it is fundamental to avoid stretching of the interior fibre optics which would increase the attenuation of the signal. The amount of optic nucleus inserted inside the coating has to be controlled in order to assure that the traction margin is enough to meet the mechanical specifications of cable charge in service. In the particular case of OPGW conductor (Optical ground Wire), Pirelli Telecom Cables and Systems S.A together with Technological Development Centre SARTI, have developed a specific application which allows us to control the differential nucleus with respect to an aluminium tube during the process of emptying the aluminium nucleus, using a parameter called *richness* (quotient between optical nucleus length and coating).



Operator's front-end display, it allows us to verify the correct functioning of the equipments which configure the system and provides information about the parameters: velocity (m/s) and length (m) of the nucleus and aluminium and tension.

Two optical sensors which have been incorporated in the manufacturing system, measure the velocity and length of the nucleus of the conductor using a laser beam which is focused on the product (Doppler effect).They are connected to a PC through a RS485 communication port where a program developed in LabVIEW manages and controls the application. So an exhaustive on-line quality control of the material in the intermediate stage has been designed which allows intervention in the production process.

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