



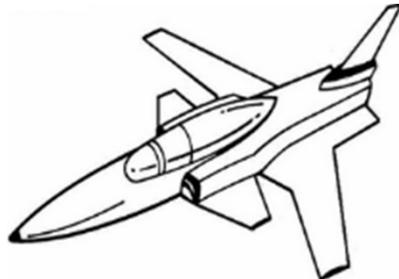
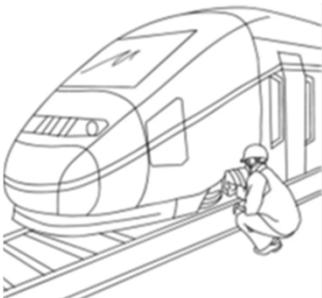
Measurements, instrumentation, telemetry, fiber optics

We have been providing solutions in different parts of the world as in the U.S.A., India but also in Europe , Belgium, Italy and Spain.

In Europe we sold American sensing devices when our principals allows us to do so.

In several countries we are offering mainly our French sensors, instruments and telemetry systems and are offering fiber optics based solutions.

Following lines provides few ideas about our capabilities.



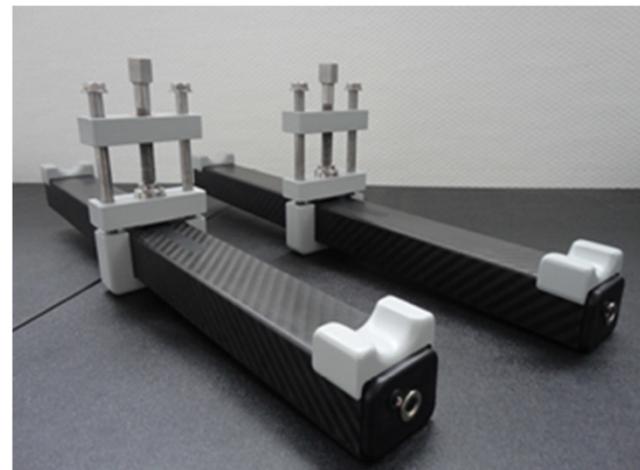
Specific sensors

Why searching to design an existing product that can be purchase from excellent manufacturers ?
Our aim is to think and design very specific sensors and systems. With a team of skilled mechanical engineers, electronics engineers and experts in very particular business, we invest our efforts to offer outstanding instruments no one else carry.

Some sensors are dedicated to load measurements, to pressure or vibrations.

We calculate proof bodies, have, for instance, strain gages bonded then calibrate on real calibration rigs or achieve vector calibration.

Electronics are specifically designed to match application.



Avalanche warning system

We developed a full system dedicated to measure loads in traction on cables strength on a net. When snow pushes the net, tons are applied on cables. The system uses 3 load (1) cells, a data logger with GPRS communication (2), a rechargeable battery (3), a solar energy regulator (4) and solar panel (5).

Complete device is installed for years and is completely autonomous. With no sun, battery can last for 2 month but solar panel recharge battery regularly. Data logger has its own small rechargeable battery.

System communicates both ways up link and down link, provides alarms, discharge data once a day, can be reprogrammed from main control room located in the valley.



High temperature measurements.

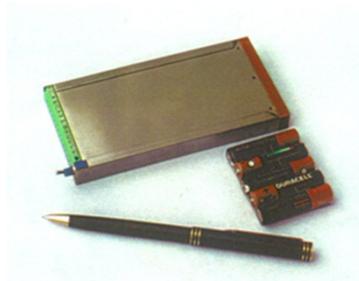
We are developing high temperature housing with internal receptacle getting a phase changing product tank. On top of this tank a telemetry system or a data logger withstanding, at least, 100 °C.

Surrounding the receptacle an insulating material delaying calories penetration toward tank and telemetry. This assembly is then inserted in an housing.

Sensors are connected to the electronics. Calculation tells thickness of insulating material and choice of phase changing material.

When temperature grows inside the housing, the fluid in the tank will increase from solidification to fluidification and then to evaporation. Measuring temperature from fluid to vapor state will provide the limit, end of vapor phase, where the electronics threshold temperature withstanding would damage the system.

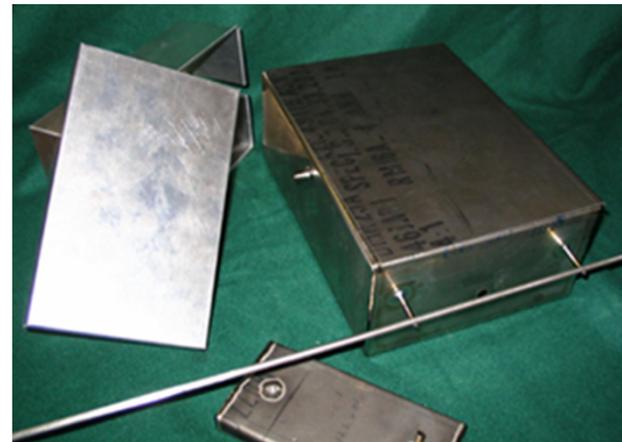
Then it is possible to measure for long processing cycles at very high temperatures and this continuously.



Electronics



Receptacle



Titanium part of a complete system

Telemetry system

Radio based telemetry system sound very simple and everyone offers solutions, some based on WiFi or Bluetooth, some based on digital but most of the time systems are designed by electronic engineers assembling pieces of a puzzle.

Sunk in telemetry since 1979, offering industrial short range telemetry systems since 1984, developing telemetry since 1993, we started new design in 2006.

Our systems, single channels or multi channels are based on pure analogic FM / FM technology because it is the best solution for efficient, large bandwidth measurements on high speed rotors and under harsh environments.

To learn more please see our telemetry product catalogue

Torque meter on production



Telemetry parts



Telemetry kit

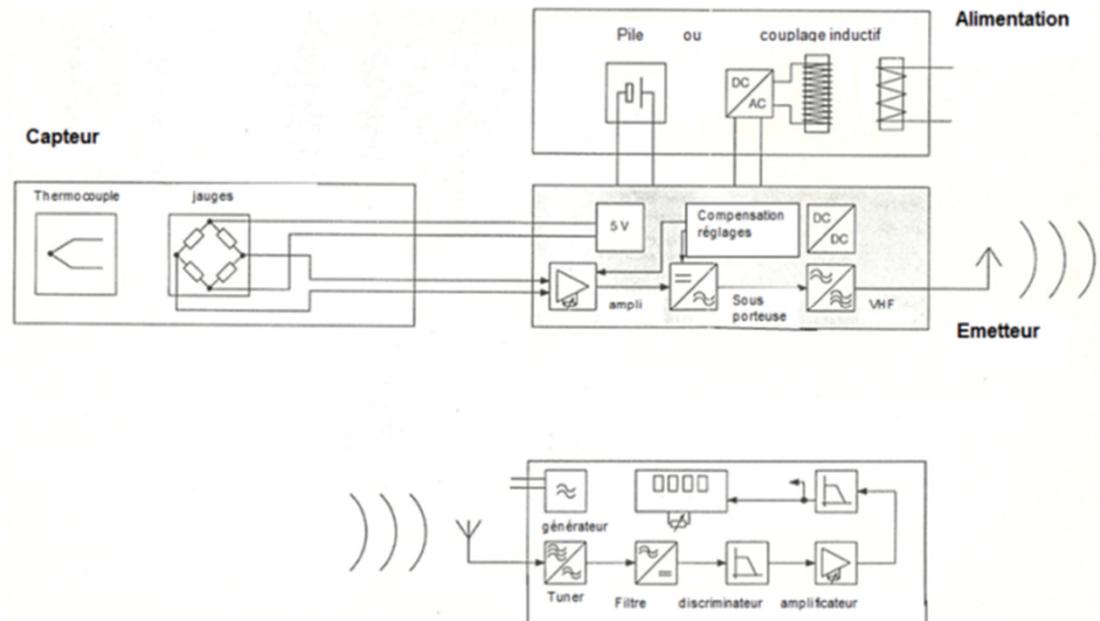


Solution design

We, for instance, develop torque measuring systems. From an existing analyzed kinematic line we think of the best part of a shaft to measure torque. The aim is to avoid cutting kinematic line using part of it to implement strain gages.

Calculation will provide the output of a full strain gages bridge. Then a mechanical support of the electronics has to be designed as well as a power supply (either batteries or inductive power supply). All components are installed and connected together, zero balancing and gain adjust are achieve before mechanical calibration.

Obviously to improve sensitivity and accuracy, one can make the choice to machine the proof body in order to increase the number of strain ($\mu\epsilon$) or, in some cases, to design a new proof body including mounting devices and others.

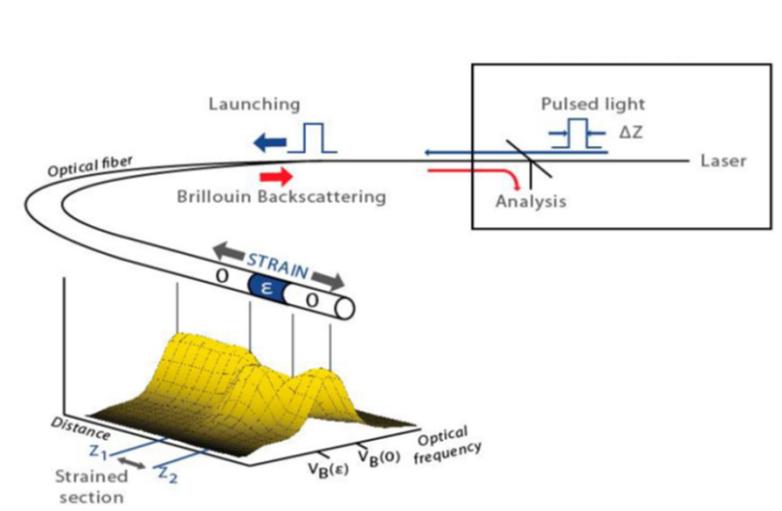
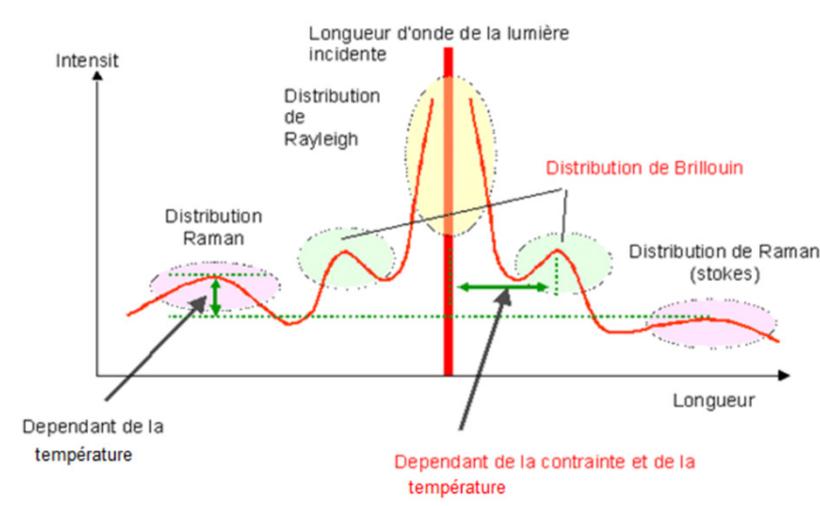


Fiber optics

Fiber optics may be used for measurements all along their length. A light pulse goes through the fiber and will scatter when temperature and/or strength are applied. At the interface between the core and its envelope, there will be measurable amplitude (Raman) or frequency drift (Brillouin). Flight time of the pulse is known and will allow location of the phenomenon.

In other words a fiber optic line of 1000 meters will have, at least 2000 measuring points or sensors. Knowing the distance can be 50 kilometers ...

But the use of fiber optics needs expertise in terms of designing fiber lines, implementing these lines, choosing the appropriate data logger, thinking about achieving a complete architecture for a specific application.

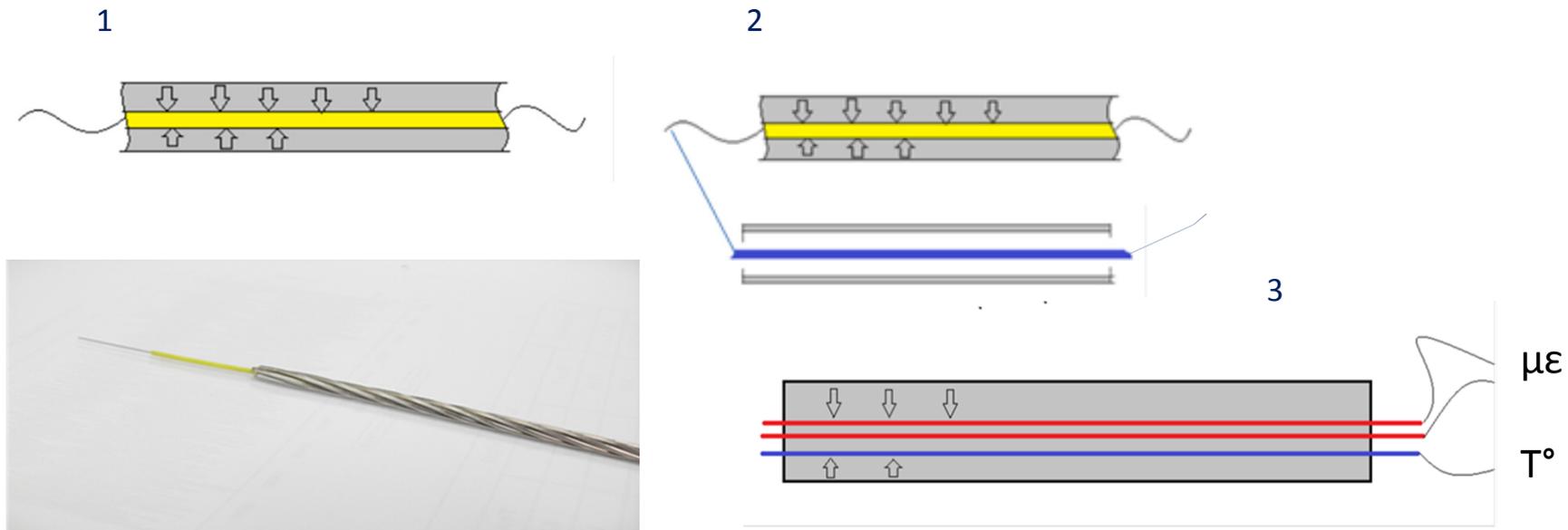


To achieve a coherent measurement with Brillouin mode, fiber optic has to be pre strength in order to provide a real and stable reference to strength measurement (1). On another hand, Brillouin gives simultaneously strength and temperatures, in order to separate both and has a lot Brillouin units need to loop fiber optics, the way to go will be pre strength when the back pass will be free in protection sleeve to avoid strength (2). Then, it will be possible to separate both phenomenon measurements.

Some data loggers do not need a loop, then it will be the use of two separate lines to operate in Brillouin or one line for strength – Brillouin – and one line for temperatures – Raman (3).

As the fiber optics for Brillouin are single mode and fiber optics for Raman multimode, it will be easy to get both fibers in a pre strength lines.

Main concern will then be to install the fiber properly to achieve measurements.

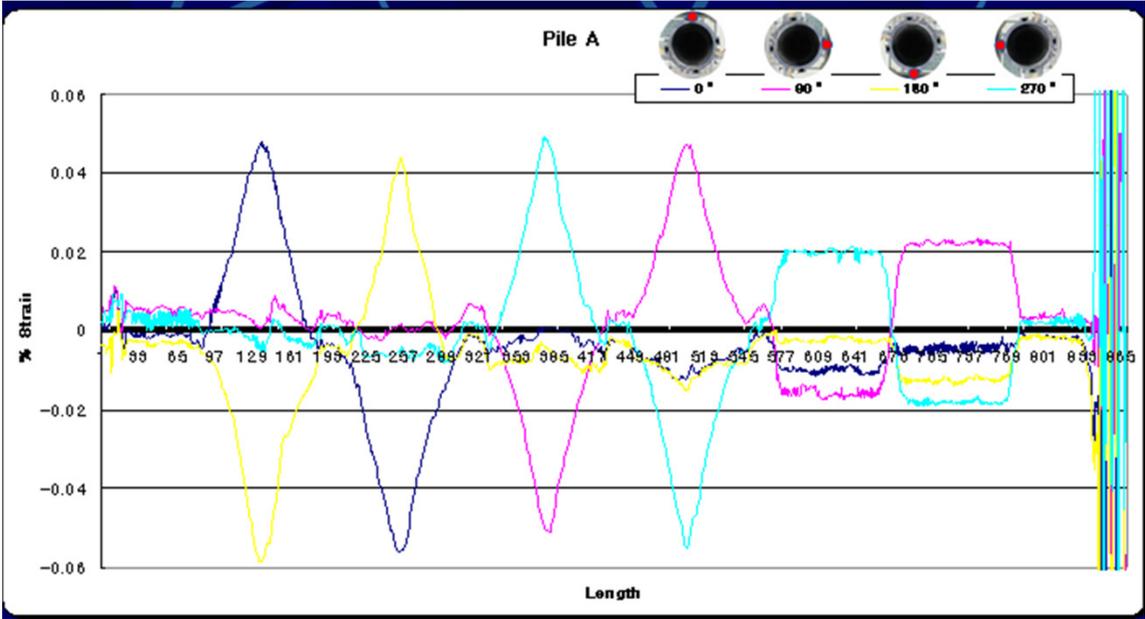


Fiber optics measures strength and temperatures but from strength it is possible to measure the direction from where strength is applied. Setting 4 lines of fibers on a tube at 90 angular degrees and coaxial to its length will allow measurements of 4 strength on the section. The 4 strength combined will give the sense of application of the load. This will be repeated on whole length of the tube at spatial resolution accuracy and can, therefore be done on very long length.

Due to spatial resolution, a straight fiber vertically inserted in water would make the difference from water temperature from air temperature and provide an information on level. Unfortunately the height accuracy will not be sufficient for accurate level measurement. What can be done is spiraling the fiber, increasing the length and therefore providing a level measurement accuracy of few spires.

Obviously both inclinometer and level measurement can be made with a single rod, then a single bore hole.

Inclinometer



Level sensor



Fiber optics solutions can address many different applications. Oil and gas business is probably the one every body think of but bridges, tunnels, slopes, rock falls, dykes, dams and much more can be monitored with such solutions.

We have up to now, some applications in France and know a lot of partners particularly experts in oil and gas research, dyke monitoring, tunnel monitoring, anchors and others.

To learn more please contact us.



Please feel free to contact us for specific applications.



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