LIM : GENERAL PRESENTATION

LIM stands for “Logging Instrumentation & Measurement”
LIM was created in 1985**.**
LIM is a specialist in Drilling Measurement equipment and solutions

30 employees, including 9 R&D engineers
More than 2 700 devices have been sold all over the world
50% France, 50% Export (Europe, Africa, Americas, Asia, Australia,..).
Geotechnical Drilling, Foundation Drilling, Drill & Blast, Exploration Drilling.

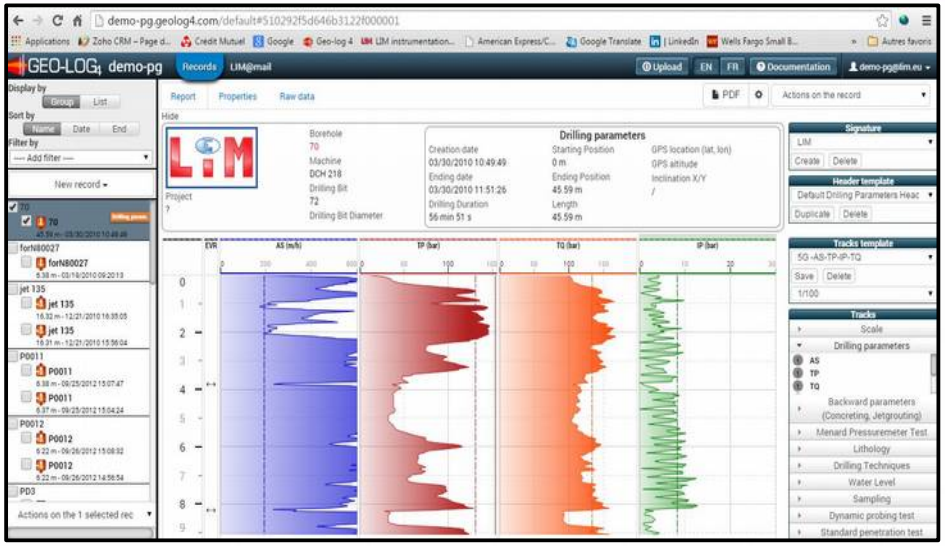
LIM operates internationally

LIM SAS locations in France: Lyon, Paris, Nice.
LIM LOGGING SA: Rodange (Luxembourg)
LIM Africa : Ouagadougou (Burkina Faso) & Abidjan (Ivory Coast)
LIM Technology (North America): Atlanta, GA (USA)
LIM Russia: Ekaterinburg (Ural)
Distributors in Germany, Spain, Sweden, Canada, Chile-Peru, Singapore, China.

LIM has customers all over the world

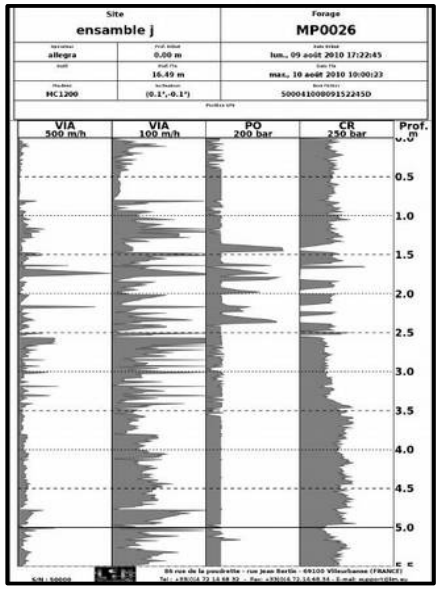
Since its creation in September 1985, **LIM SAS** has developed 5 generations of equipment, manufactured and sold more than 2,500 indicators and data recorders on all 5 continents in its various business areas.

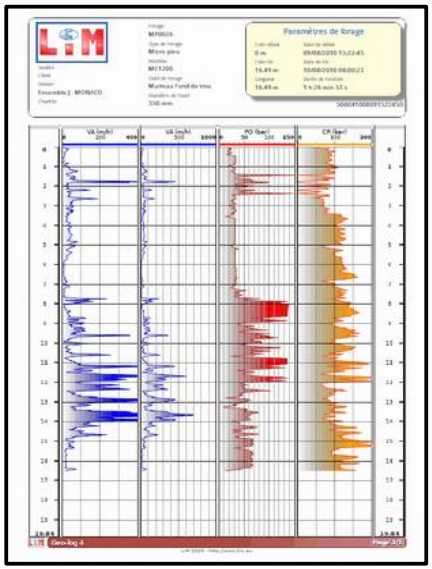
PocketLIM 5G : Drilling Parameters Recording (MWD).



https://lim.eu/en/

Drilling Parameters Acquisition in real time





The main drilling parameters that are recorded in real time vs depth are :

Instantaneous Advance Speed (IAS) or Penetration rate (m/h, ft/h or m/min, ft/min).

1 to 4 hydraulic pressures in bar or psi to choose from the **Tool or Bit Pressurer (TP)**, **Injection Pressure of the drilling fluid (IP)**, **Torque Pressure (TQ)**, **Holdback Pressure (HP)**, **Striking Pressure (SP)**, ...

Rotation Speed or Bit RPM (Round/min).

Reflected Vibration (RV) (*Vibralim*) of the drill string, it is a non dimensioned parameter whose the amplitude is varying according to the drilling method and depth.

Drilling fluid flowrate (Q) in l or gal/min.

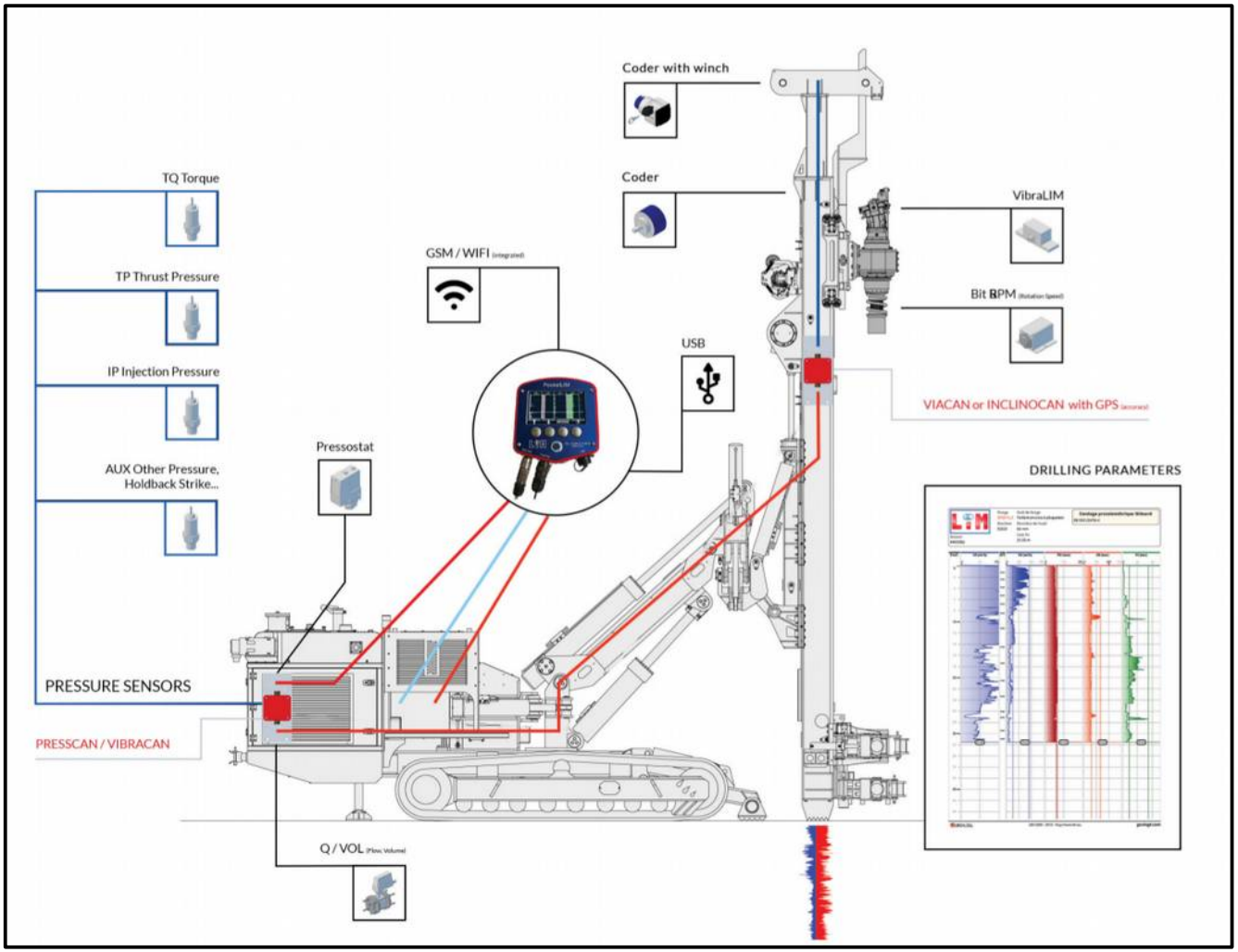
X and Y inclination of the drill mast.

The PocketLIM 5G data logger

PocketLIM 5G :

- **Huge 2 Gb internal memory** (millions of m);
- Embedded **Linux kernel OS** (V 2.6);
- Weight : 2 Kg (4.4 lb)
- Housing size: 157x165x57mm (6.18x6.5x2.24'');
- **16 bits color touch screen 5''** 840 x 480 (16/9) + 4 buttons;
- Virtual PDF printer;
- **GSM/GPRS 3G-4G Modem** and **Wi-Fi** for data transmission using Internet;
- **USB data Synchronization**. Site conditionned USB is provided ;
- Metric GPS positioning
- 12-24 VDC power supplied by drill rig battery;
- Protection box, mounted bracket and transportation case;
- The recorded data is stored and transmitted either over the internet (3G/4G or Wifi) or downloaded to a USB. The file format used by **LIM** is **« .BOR ».**
  It is an open format to make possible data exchange.
  https://bor-form.at/en/

Installation of sensors



By using the **CAN BUS** network technology for the data transmission from the various sensors,

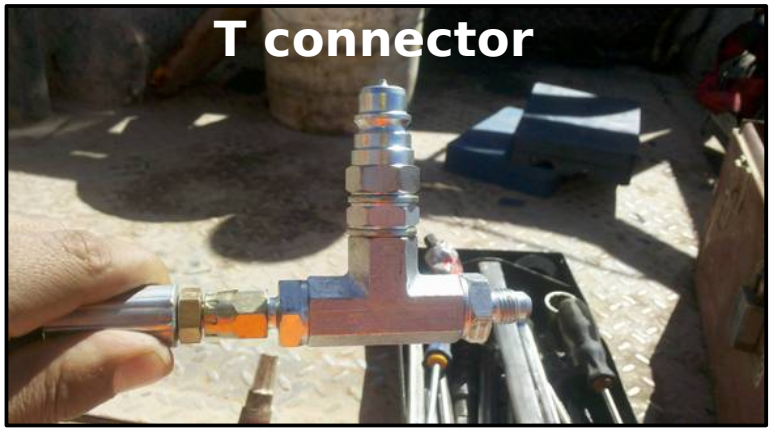
The installation and maintenance are simplified.

PocketLIM 5G, sensor installation : Depth/Speed

Chain drive system:
The depth encoder (optical) is directly fitted to the shaft of the chain sprocket.

Cylinder feed system:
Reel with cable (5 or 10 m – 16.4 or 32,8 ft).

PocketLIM 5G, sensor installation : Pressures



TP: Thrust Pressure
HP: Holdback Pressure
IP: Injection Pressure
TQ: Torque

PocketLIM 5G, sensor installation : Revolution Speed

Proximity sensor (magnetic):
The detection element creates a high frequency electomagnetic field at the tip of the sensor and its amplitude is dampened by the presence of a nearby metal mass.

PocketLIM 5G, sensor installation : Fluid flowrate & volume

Installation of an electromagnetic flowmeter.
Pump strokes can also be counted with a proximity sensor equivalent to revolution speed measurement.

PocketLIM 5G, sensor installation : X,Y drill mast angles

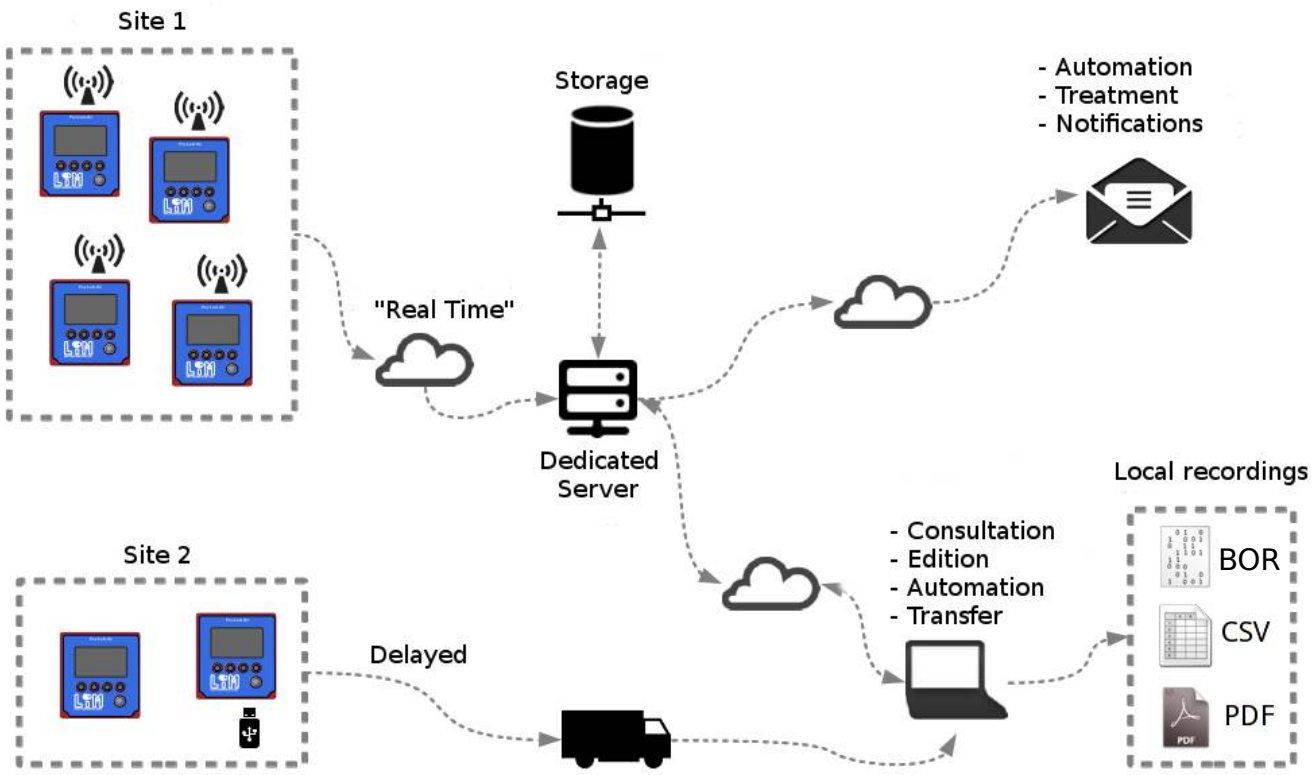
The **INCLINOCAN-2** bus unit is attached to the drill mast. It contains the X and Y inclinometers that measure the angles of the drill mast for positioning before drilling.

The MiniLIM 5G data logger

MiniLIM 5G :

- **Internal memory 1 Gb**;
- Embedded **Linux kernel** OS;
- **4'' Color touch screen** (16 bit);
- Weight : 1 Kg (2 lb)
- Housing size (mm, ''): 160x120x50 – 6.3x4.7x2;
- **USB data Synchronization** only;
- Power supplied by drill rig battery;
- Protection box and mounted bracket ;
- The recorded data is downloaded to a USB.
  The file format used by **LIM** is « **.BOR** ».
  It is an open format to make possible data Exchange.
  https://bor-form.at/en/

LIM@MAIL: Data Transmission via Internet



Lim@Mail is an online service using the 3G/4G or Wifi. It allows, without the operator intervention, the transmission and automatic synchronization of datafiles recorded by the **PocketLIM**. Then, the BOR, PDF & CSV datafiles are automatically resent by email to the receiver. With the **GEO LOG 4** cloud based service, the geotechnical data is automatically evaluated and laid out before resending.

GEO LOG 4 : Drilling data processing cloud based service.

GEO LOG 4 (www.geolog4.com) is a cloud based software :

- it processes drilling data recorded by the **PocketLIM 5G** & **MiniLIM 5G** data logging systems.
- it sets up the geotechnical borehole logs with all In-situ and laboratory data.

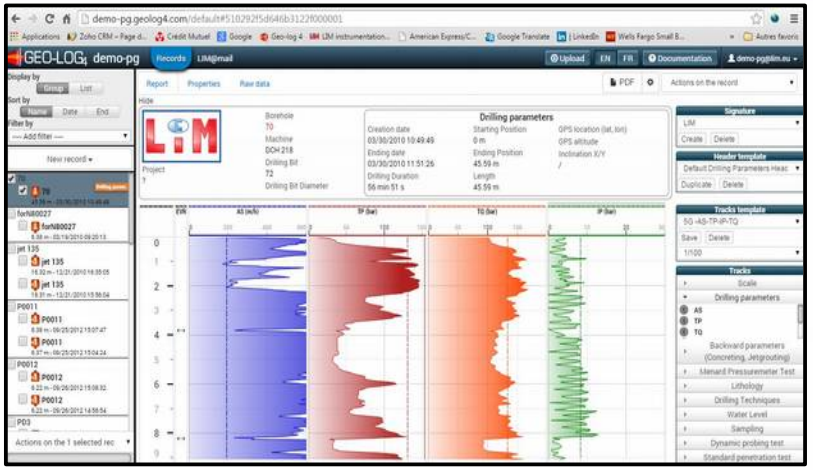
The main benefits of the **GEO-LOG 4** cloud solution are :

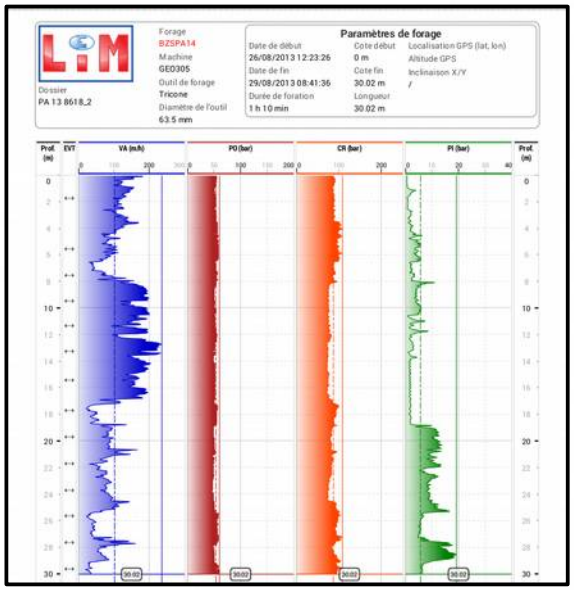
- Online version is meaning of the last upgrade version at all time;
- Access from any computers or electronic devices connected to internet with any operating system (Windows, Apple, Android, ...);
- Online version can be subscribed either monthly or annually.

GEO LOG 4 is compatible with **BOR files** for data recording devices importation and is **AGS files** compatible for data exchange.

https://www.ags.org.uk/data-format/

https://bor-form.at/en/





PocketLIM wireless tethering : Drilling parameters graphs external display in real time (tablet, smartphone, PC, screen, ..)

Repetition in real time of drilling parameters graphs displayed by PocketLIM to an external tablet.

Example of drilling parameters graphs displayed in real time on an external screen.