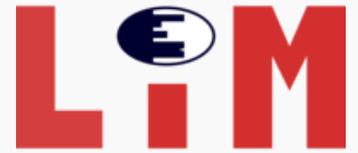


# PocketLIM - Sandvik DX900i

Mounting a PocketLIM recorder on a Sandvik Ranger™ DX 900i drill



## Mounting a PocketLIM recorder on a Sandvik Ranger™ DX 900i drill

### Introducing the Sandvik Ranger™ DX900i drill rig

The new Ranger™ DX900i is the flagship model of the new Sandvik Ranger™ DXi family. Featuring the most powerful rock drill in its class, Sandvik intelligence features and a counterweight, revolving superstructure enabling ultimate stability, Ranger™ DX900i characterizes the revolutionary generation of Ranger™ DXi top hammer surface drill rigs. With an ultimate drilling coverage of 290° (55 m<sup>2</sup>), it is the most powerful and efficient rig in its class.

The Sandvik Ranger™ DX900i drill like all machines of its generation is CANBUS compatible and is factory equipped with all the sensors allowing real-time acquisition of drilling parameters vs depth, consultation of machine parameters (hammer) and engine parameters using the standard J1939 protocol.

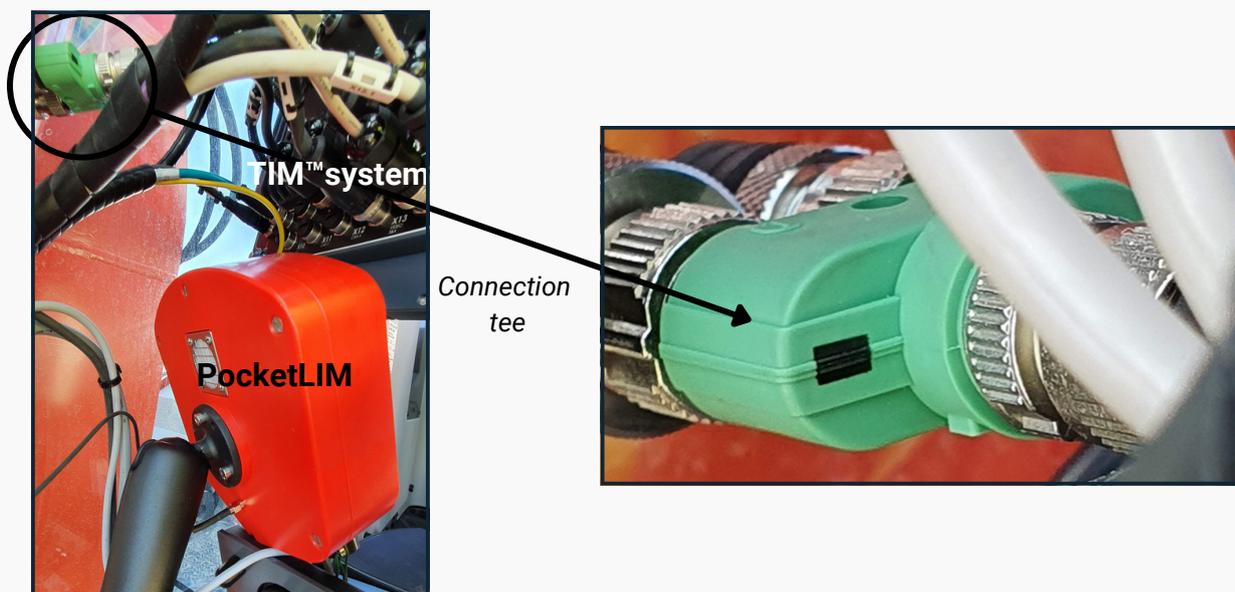
### End customer request

The end customer, who has just acquired this new drill rig, is a major player in the French market in the field of drill rental for drill & blast. This machinery rental company owns a fleet of around twenty drills which it rents out to drill & blast companies with which it has signed a multi-year contract. Like any equipment rental company, this client offers drills from several manufacturers, so he owns Sandvik drills but also Epiroc and Furukawa (FRD), machines both top-hole and down-the-hole.

In order to manage its entire fleet, this customer has chosen to install **PocketLIM** recorders on all its drills because they allow it in real time, thanks to the **Drill@LIM** "universal" application, to geolocate, remotely monitor and above all to be warned of faults (motor, hammer, etc.) of all machines regardless of their brands and models. This real-time detection of faults is essential for him because it allows him to react as quickly as possible.

### Installing PocketLIM on Sandvik Ranger™ DX900i

The **PocketLIM** being 100% CANBUS compatible, the installation on the machine does not require any addition of sensors. The Sandvik Ranger™ DX900i drill is equipped with the TIM™ system, 100% CANBUS compatible, which controls all of the machine's components via all the sensors installed. It is therefore sufficient to interface via a tee the **PocketLIM** at the level of the CANBUS cable connected to the TIM™ system as shown in the photos below.



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The two TIM™ and PocketLIM systems installed in the Sandvik Ranger™ DX900i drill cabin

## Geolocation, installation of the LIM GPS box

For GPS geolocation, LIM provide a low precision (metric) GPS box. This box is installed in the engine compartment, photo below



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### Using the PocketLIM - applications

1) For the drilling rig rental client, the main application for using **PocketLIM** is [Drill@LIM](#), a unique application, which allows him to monitor in real time each of the drills in his fleet, all brands combined.

**Drill@LIM** is a real-time web application that geolocates drills to the nearest meter/yard and sends by email any alert of an engine, machine or hammer fault as soon as it appears. This alert system allows the manager of the drill fleet to intervene as quickly as possible to solve problems and avoid any stoppage or slowdown in production.

With **Drill@LIM**, after entering the username and password, the fleet manager can access a table at any time providing real-time information on various technical information concerning each machine. The main information displayed is the GPS position, the faults that appeared, the name of the operator, the engine speed, the engine hours, the oil pressure, the total consumption, the hydraulic pressure, the hammer hours, the length drilled cumulative and the total number of holes drilled. This information is useful in order to plan the various maintenances of each drill. An table extract is shown below.

**Drill@LIM** automatically generates daily and monthly reports in Excel format providing most of the information listed above for each machine.

| GPS position                         | Machines | From | Until | Record date               | Faults                     | Engine Speed (rpm) |
|--------------------------------------|----------|------|-------|---------------------------|----------------------------|--------------------|
| <a href="#">45.7752457_5.0273333</a> | D900     | ∞    | ∞     | 03/22/2022, 3:06 PM GMT+0 | J1939_158                  | 1016               |
| <a href="#">45.7752609_5.0273347</a> | D900     | ∞    | ∞     | 03/22/2022, 2:56 PM GMT+0 | J1939_158                  | 1000               |
| <a href="#">45.7752457_5.0273347</a> | D900     | ∞    | ∞     | 03/22/2022, 2:46 PM GMT+0 | J1939_158                  | 1902               |
| <a href="#">45.7752457_5.0273347</a> | D900     | ∞    | ∞     | 03/22/2022, 2:36 PM GMT+0 | J1939_158                  | 1000               |
| <a href="#">45.7752457_5.0273328</a> | D900     | ∞    | ∞     | 03/22/2022, 2:26 PM GMT+0 | J1939_158                  | 997                |
| <a href="#">45.7752457_5.0273385</a> | D900     | ∞    | ∞     | 03/22/2022, 2:16 PM GMT+0 | J1939_158                  | 0                  |
| <a href="#">45.7752457_5.0273395</a> | D900     | ∞    | ∞     | 03/22/2022, 2:13 PM GMT+0 | J1939_158                  | 0                  |
| <a href="#">45.7752457_5.0273395</a> | D900     | ∞    | ∞     | 03/22/2022, 2:13 PM GMT+0 | RIG_EMERGENCY_STOP, J19... | 0                  |

2) For the driller, the **PocketLIM** helps to position the drill mast and records in real time the drilling parameters vs depth.

The main drilling parameters that can be recorded on a Sandvik Ranger™ DX900i are:

- The Advance Speed (AS) in m/h, m/min, ft/h or ft/min;
- The Hydraulic Pressure on the Tool (TP) in bar or psi;
- The Hydraulic Pressure of the Torque (TQ) in bar or psi;
- The Air Pressure (AP) in bar or psi.

All these parameters are accessible via the CAN BUS interface of the PocketLIM with the TIM™ system.

In addition to facilitating the work of the driller, these parameters which are recorded will enable the miner to assess the geo-mechanical quality of the soils drilled through and thus optimize the loading of explosives into the boreholes. Faults, fractures and cavities are very well detected.

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## Mounting a PocketLIM recorder on a Sandvik Ranger™ DX 900i drill

During drilling, the **PocketLIM** displays the drilling parameters in text or graphic form on its high-resolution 7" screen. Thanks to its "mirroring" function, the display is also done in real time remotely via the internet. It is therefore possible to view what is happening on the machine on a remote screen, tablet or smartphone as shown in the images below.



**Simultaneous graphical display of drilling parameters on the PocketLIM screen and remotely on a smartphone screen.**

Once the drilling is finished, the drilling parameters recorded by the **PocketLIM** are automatically transmitted via Wifi, GPRS or USB key in the cloud ([LIM@mail](mailto:LIM@mail) service) in order to be automatically processed by the [GEO-LOG 4](#) web application which performs the layout of PDF reports. A specific module allows, according to criteria chosen by the operator, to represent a color log classifying the terrains according to their geo-mechanical criteria (hardness). This cutting is done automatically.

