LIM SAS

User manual

User manual: PocketLIM

Drilling depth and speed 2 to 4 pressure sensors

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	User Manual Drilling Option and Pressure Sensors	*Updated*: 02/27/2024	
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		Public document	

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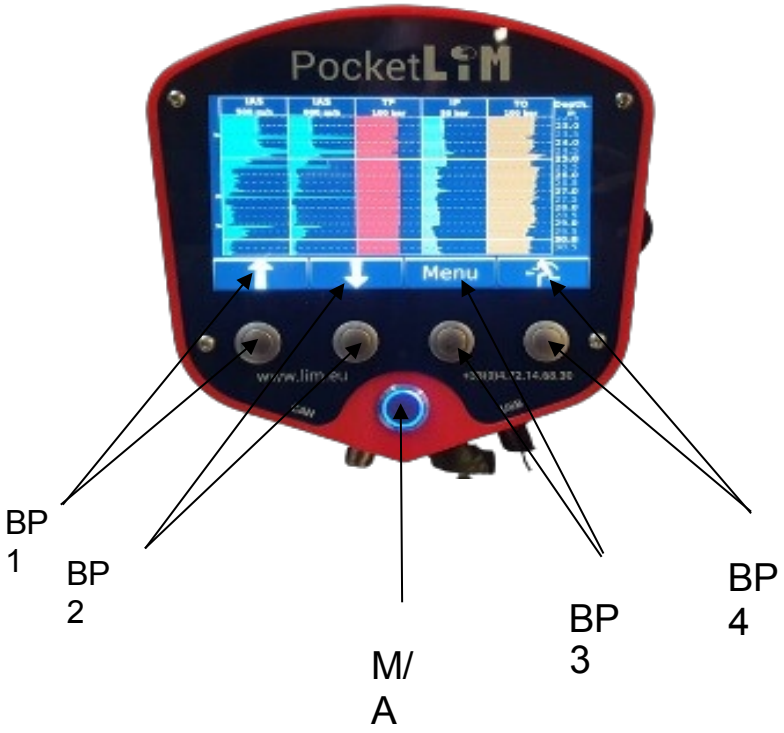
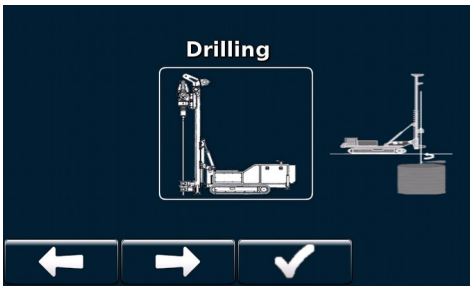
1. Description of buttons

The PocketLIM has 5 buttons on the front panel. A Start/Stop button (M/A) and 4 buttons to control the various functions of each screen. The actions of these buttons vary depending on the active screen. In the rest of this manual, we will refer to them from left to right as "BP1," "BP2," "BP3," and "BP4." These buttons can be used either as physical push buttons or as touchscreen buttons.



2. Starting PocketLIM "Drilling Option"



To turn on PocketLIM, press the central "On/Off" ("M/A") power button and the device wil turn on. If only the "Drilling" option is enabled on your device, you will go directly to the standby screen. If one or more other applications are activated, an application selection menu will appear. Use the "BP1" and "BP2" arrows to highlight the "Drilling" icon, then press the "BP3" key to access the "Drilling Standby" menu.

3 "Drilling Standby" menu

Once you have confirmed the "Drilling" option, or when you close a drilling operation, th PocketLIM returns to one of the following standby screens.

Drilling Only Option Screen

Drilling/Pressure Option Screen

3.1 Description of the standby screen:

The bar at the top of the screen contains information about the status of the PocketLIM, such as:

Name of the current drilling operation: Name of the current drilling operation

 : The eye at the top center of the screen indicates that the "mirroring" option is active: this means that the PocketLIM screen is visible on a remote device (smartphone or PC) and can be controlled remotely. The eye at the bottom right of the screen displays graphs of the last recorded drilling operation.

 : Indicates that data transfer via GSM "  " or WIFI "  " is active. The number above the symbol indicates the number of files waiting to be transferred. When the symbol is red, no network is detected, and when it is green, a network is detected.

 : USB symbol, the number above the symbol indicates the number of files waiting to be transferred to the USB drive. If the number is red, this indicates that no USB flash drive is connected or detected. If the symbol is green, this indicates that a USB flash drive is correctly connected. The transfer will take place automatically if the "USB auto-sync" mode is set to "ON" (see the "USB" menu "Toolbox") menu), otherwise operator intervention will be required (see the "Toolbox" "Toolbox") menu.

 : Number of CAN sensor boxes (or functions) detected: this indicator checks that all installed functions are operational.

Time: Current local time


Access to the "Toolbox" menu: Access to the "Toolbox" menu

 When PocketLIM is in Drilling/Pressure mode, this icon allows you to switch to Pressure recording without closing the drilling session. PocketLIM automatically detects the type of Pressure connected (automatic or manual).

Pressure sensor: Indicates the instantaneous drilling speed or ROP.

Indicates the instantaneous drilling speed or ROP.

Indicates the depth of the drill bit in the borehole.

Previous data is always displayed.

The display of the following information can be configured by the operator, who can activate or deactivate it and choose its position on the screen (see the "Toolbox Menu" manual).

Display of measured and/or recorded parameters (in this example, the **TP** feed pressure, **TQ** torque pressure, and **RSP** rotation speed are visible...).

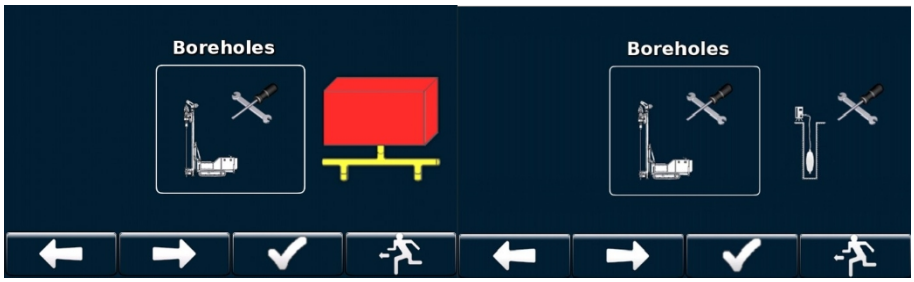
Cumulative depth: Display of the total cumulative depth and the number of boreholes drilled. To reset these parameters, simply press the touch screen in the parameters area and confirm the reset by pressing "✓"  in the window that appears.

3.2 Drill configuration:

When installing your equipment on the drill for the first time, you must calibrate the various sensors. To do this, go to the "Installation" menu in PocketLIM. Press  , then select the "Installation" menu (see "System settings" section). If your equipment is already calibrated, you can start drilling (see "Drilling" chapter).

4 "System Settings" menu:

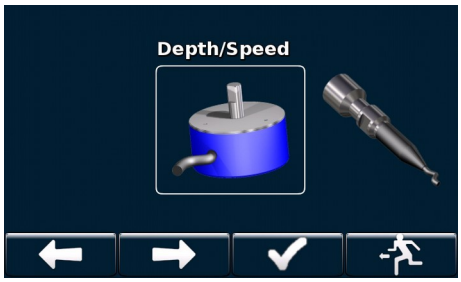
From the "Standby" menu, press the "BP1" key , then select the "Installation" option using the "BP1" and "BP2" arrows, then press the "BP3" key to confirm. For the "Drilling" option, select the "Drilling" option using the "BP1" and "BP2" arrows, then press the "BP3" confirmation button.



"Drilling only option screen Drilling/pressing option screen

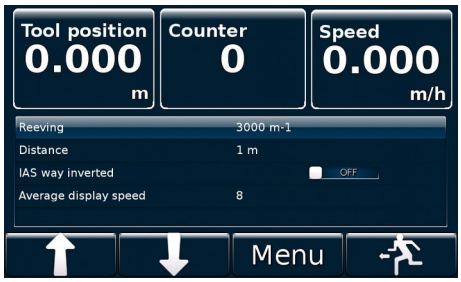
4.1 Depth/speed calibration:

After selecting the "drilling" option, select the "Depth/speed" menu using the "BP1" or "BP2" arrows, then confirm with the "BP3" button.



This menu allows you to configure the depth sensor installed on the machine. LIM offers two types of depth measurement: a "Direct Grip" system in which the measurement encoder is driven directly by the drill head motor or drive chain, and a nylon rope or stainless steel cable housing system with integrated encoder and spring.

Operating mode:



Rope pulley: Number of sensor pulses per meter of travel.

Distance: Length of the drill head stroke used to calibrate the depth encoder. It must be at least 1 meter but can be up to the total length of the drill head stroke on the mast.

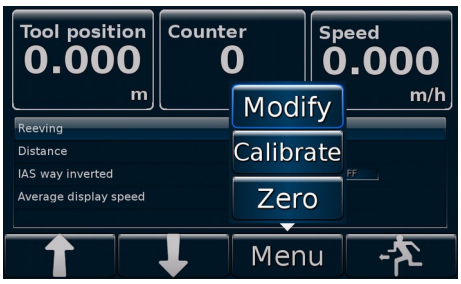
Reverse IAS path: Ensures that the depth measurement is positive when the drill head descends. If the tool position shows a negative value during drilling, this parameter must be modified.

Average speed display: Prevents false speed variations by displaying the average speed every "x" cm (here every 8 cm).

Depth measurement calibration:

Unknown hoisting/lifting value:

- Place the drill head at least 1 meter from the stops at the bottom of the mast.
- Adjust the travel distance value (D) on the PocketLIM to the distance between the lower stops and the bottom of the drill carriage (see image opposite).
- Press the **Menu** button and then **Zero**, which will reset the counters to zero.
- Lower the drill carriage to the lower stops and press the **Menu** button, then **Calibrate**.
- A new reference value will be displayed on the screen.



At the end of this operation, it is advisable to note the tilt value of your machine, which will allow you to enter it directly if you change machines or install a new one.

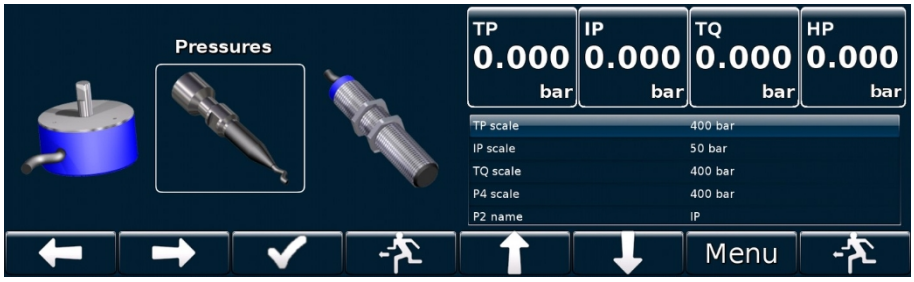
Known winch/hoist value:

If the gear ratio/lift value is known, it can be entered manually by selecting the Gear ratio/Lift line using the "BP1" or "BP2" arrows, then pressing "Menu" Menu , then "Modify" Modifier , then entering the value using the alphanumeric keypad, then confirm your change by pressing "✓". ✓

Once the gear ratio has been set, check the direction of measurement. Position the drill head so that it can be lowered (drilling direction), reset the counters to "ZERO" and move the drill head downwards. If this value is negative, select the "Inverted VIA direction" line, then press "Menu." Menu , then "Modify" Modifier , the value of the line will change from "on" to "off" (or vice versa).

4.2 Calibrating the pressure sensor:

Select the Pressures menu using the "BP1" or "BP2" arrows, then confirm with the "BP3" button. ✓



LIM uses (except for specific applications) pressure sensors with a measurement range of 0-50 bar (blue label), 0-100 bar (yellow label), and 0-400 bar (red label). These sensors are calibrated during manufacture and do not normally need to be readjusted by the customer. If a new setting is required after installation, simply follow the Menu/Modify procedure.
A white pressure display indicates that the sensor is correctly installed and detected by the data logger, while a red display indicates that no sensor is connected or detected by the data logger.

4.2.1 Selection of P2 and P4 sensor IDs:

The parameters measured by the PO (supply pressure) and CR (torque) sensors are fixed for all applications, while those measured by the P2 and P4 sensors are variable. The hydraulic circuit to which they are connected must be specified during commissioning. Select the sensor to be modified by highlighting the "P2 name" or "P4 name" line using the "BP1" or "BP2" arrows, then press "Menu" "BP3." Menu Then press "Modify." Modifier

Select the pressure measured by sensor P2 (or P4) using the "BP1" or "BP2" arrows, then press "BP4" to confirm.

You can disable one or more pressures by pressing "BP3" "Modify." Editer
Then select the pressure(s) to be deleted using the "BP1" or "BP2" arrows and confirm your choice by pressing "BP3" . Each disabled pressure can be reactivated by following the same procedure. To exit this menu, press "BP4"

4.2.2 Entering the sensor measurement range:

For each sensor installed, check that the value indicated on the "Sensor scale" line corresponds to that of the sensor installed. If this is not the case, select the line using the "BP1" and "BP2" arrows, then press "Menu." Select "Menu " then "Modify." Using the numeric keypad, enter the actual measurement range of the sensor.

4.2.3 Resetting the sensors:

To reset a sensor, for example PO (TP supply pressure), press "Menu" then "Zero PO." Repeat this process for each of the installed sensors, ensuring that the sensors are not under pressure during this operation. When calibration is complete, press "BP4". Press " " as many times as necessary to return to the "Standby" menu.

5. Performing a drilling operation

In this section, we will describe the parameters used for the basic application (Speed + 2 to 4 presses) and its operating mode. It is possible to display the "Total" and "Number of drillings" parameters (see "Toolbox menu" manual, section 2.7), which correspond to the total number of drillings performed between two resets of these parameters. Additional parameters are described on an application-by-application basis.

5.1 Standby screen

To drill, go to the "Standby" menu.

Drilling screen option Drilling/Pressure screen option

During the drilling phase, PocketLIM works in the same way whether in the "Drilling" option or in the "Drilling/Pressure" option. In the first case, the "BP3" button is inactive; in the second, "BP3" allows you to switch from one mode to the other. As LIM has two types of Menard pressure gauges (manual or automatic), the data logger detects the connected pressure gauge and selects the corresponding menu. If no pressure gauge is connected at the time of selection, it selects the manual PressioLIM menu.

5.2 Starting a borehole:

To start recording, press "BP3" "Start." 

on the screen, and the user will see the drilling information screen.

To modify a field, select its line using the "BP1" or "BP2" arrows. Then press "BP3" to confirm.

For the "Borehole name," "Project," "Drill rig type," and "Tool diameter" fields, the drilling operator has an alphanumeric keyboard that allows them to enter information about the drilling operation. For numeric fields such as "tool diameter," only numbers should be used.

For the "Drilling tool," "Drilling method," and "Drilling fluid" fields, the operator has access to a predefined list. Select the appropriate tool by positioning the dot in front of it using the "BP1" and "BP2" arrows, then exit this menu by pressing "BP4."

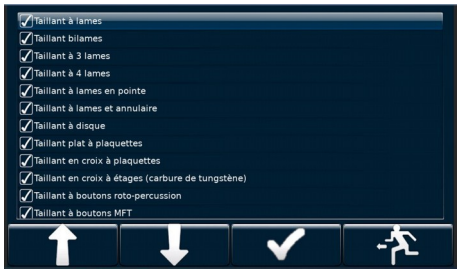
Example: drilling tools:

"START DEPTH". This function can be useful if, for example, the depth of a hole that has already been drilled needs to be increased.

"DEPTH STOP": use this option if the machine has been equipped with a sensor to control the movement of the drill head. This option must be set to "0" if the drill has not been installed with the corresponding sensor.

You can disable tools, fluids, or methods that you do not use by pressing "Edit." 

Then disable the information you want to delete. You can reactivate them at any time by returning to this menu. Exit the "Edit" menu by pressing "BP4." 



Note: The information entered in this menu will remain in memory until it is modified by the operator, even after the data logger has been turned off.

The "START DEPTH" field is usually set to "0." However, if it is changed, the PocketLIM will start recording from the depth that has been programmed. This can be useful if the operator extends the depth of a borehole whose depth is known, or if the ground level is not the "0" point of the borehole. Select the "Start Depth" line and enter the depth required to start recording at the correct depth. This value must be positive. It is automatically reset to "0" at the end of each borehole.

The "Stop depth" field automates the stopping of the drill head at a predefined depth and is mainly used on pre-equipped quarry machines. For standard installations, leave this value at "0" as this disables the automatic stop mode.

The "Drill Angle" line allows you to enter the angle of the drill relative to the vertical. With the exception of the "Starting Depth" field, all these fields retain their values between drills and even after the equipment has stopped.

The other fields are used to calculate the WOB, but if the drilling rig has not been equipped with the corresponding sensors, these fields do not need to be filled in.

5.3 Drilling phase:

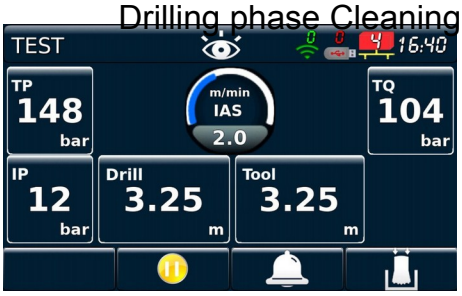
Once all fields have been correctly configured, press "BP4"  to access the "Drilling Pause" menu. Before starting recording, adjust the drilling angle and position the drill bit so that it is in contact with the ground.

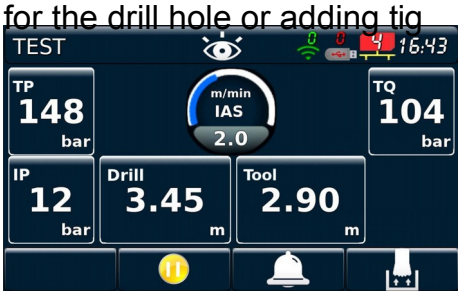
Drilling pause screen Drilling recording screen

To start recording, press "BP2"  . The PocketLIM screen will switch to recording mode, the drill and tool displays will change from red to white, and the PocketLIM will start recording as soon as the machine begins drilling.
Start recording as soon as the machine begins drilling.

Start drilling.

Drilling phase Cleaning phase for the drill hole or adding tig





Note the position of the BP4  between the drilling phase and the rod addition phase.

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The "PO" (TP supply pressure), "PI" (IP injection pressure), and "CR" (TQ torque pressure) sensors display pressures, while the "VIA" displays the instantaneous drilling speed or ROP (rate of penetration). The "BP3" button on the "Drilling" screen is called "special event." Pressing this button displays an asterisk on the graph at the corresponding depth to indicate that there has been an incident or unexpected phenomenon during drilling.
During drilling, the "Drilling" and "Tool" displays are identical and the "Tool" button "BP4" is in the down position . This indicates that the drill bit is in contact with the bottom of the hole.

The PocketLIM manages the hole cleaning phases without operator intervention. The drilling depth Drill 2.33 m remains stable and the tool depth Tool 0.73 m varies. The "Ad rod" button "BP4" is in the "up" position . When the cleaning operation is complete, the bit returns to the bottom of the hole (drilling and tool depths are identical), the "BP4" button returns to the down position, and recording resumes automatically.

5.4 Rod addition phase:

When the operator needs to add a new rod, perform the rod addition phase in the usual way on your machine, without touching the PocketLIM, once the new rod has been screwed in and your drill bit is back in contact with the ground at the bottom of the hole. Press the "BP4" button . On the PocketLIM screen, you will briefly see a "barrel" appear on the screen and the depths of the drill and tool will be equalized, so you can resume drilling.

Note:
The rod addition phase can be automated on certain machines. This option requires a box called "Modulcan" (contact our technical department for more information).

5.5 Pausing a drilling operation:

During the drilling phase, pressing "BP2" () allows you to return to "Pause" mode and suspend recording. In this mode, the movements of the drill head will not be recorded by the PocketLIM and the "Drilling" and "Tool" displays will appear in red. This allows you, for example, to perform an operation on the drill bit or, if you are performing Menard pressure tests, to record them without closing your recording, simply by pressing "BP3"  or restarting PocketLIM in "Pressure" mode. When you want to resume drilling, you must put your drill bit back in contact with the ground, then restart your recorder in "Drilling" mode or press "BP3".  from "Pressio" mode, then press "BP2" "Start". 

When your drilling is complete, press "BP2" pause  to return to "Pause" mode, then press "BP1"  to close your drilling record.

Before resuming drilling, you can view the graphs from the last recording by pressing "BP4" eye  in the Standby menu. During the drilling phase, pressing the "Drill" or "Tool" area of the screen also displays the drilling graph view.

5.6 Viewing drilling graphs:

5.6.1 During drilling:

To view graphs during the current drilling phase, tap the "Drilling" or "Tool" area 

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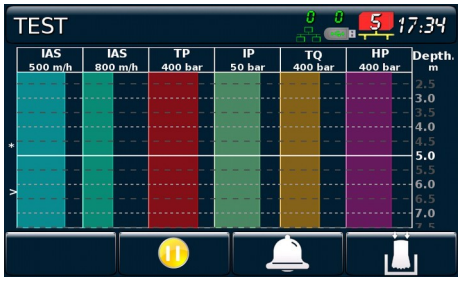
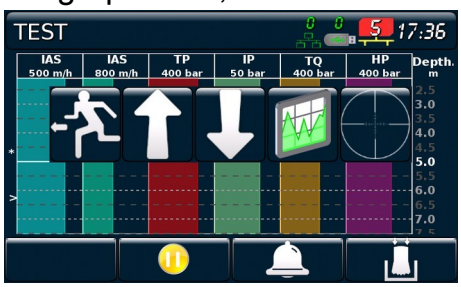


When you touch the screen in the graph area, a command bar appears



Pressing the arrows  allows you to scroll through the graph.

Touching the "target"  allows you to enter a specific depth to view on the graph. Enter the depth using the touch keyboard, then press the "✓" button  to confirm.

Pressing the graph symbol  opens a screen where you can change the graph scale. A scale value of "0" removes the displayed setting. The "Zoom" line allows you to change the vertical scale of the graph.

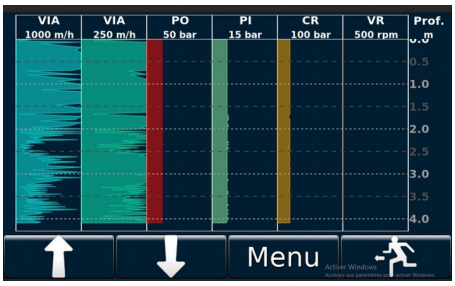
Select the parameter to be modified using the "BP1" or "BP2" arrows.

To return to the digital display, press the key. 

Press the button again  to return to the drilling page.

5.6.1 Viewing the last drilling operation performed:

In "Stand b" mode, press the "Eye" button  , at the bottom right of the screen to display the graph display screen.



How the display screen works:

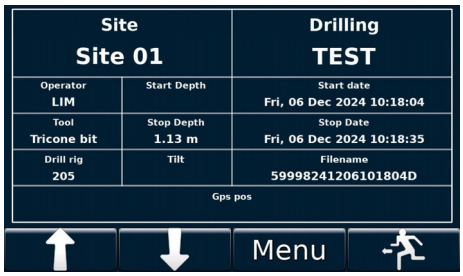
Pressing the arrows  allows you to move along the curve.

Pressing the top line 

opens a screen for changing the display scale.

Pressing the "Menu" button Menu displays a panel that allows you to zoom in on the graph change the scale, or access the summary table of drilling information by pressing the arrow.

Pressing the graph section of the screen or the "Menu" button Menu , then the horizontal arrow , displays a summary table of drilling information. Pressing the screen again returns you to the graph display screen.



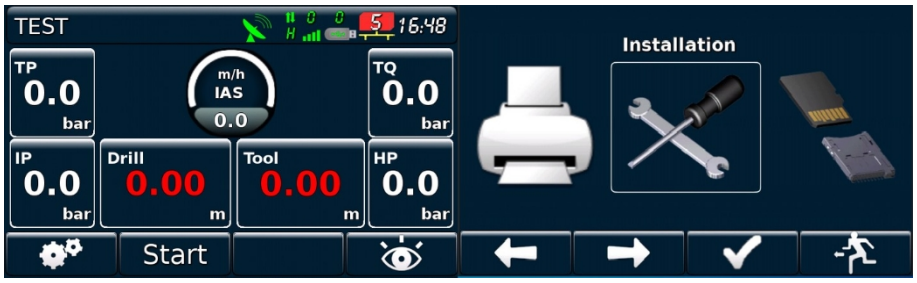
Press "BP4" to exit this menu.

6. "CAN Bus Diagnostics" menu

This menu allows the user to check the detection of the CAN boxes of the measuring devices installed on the machine. The boxes displayed here depend on the options purchased by the customer. In the "Drilling 2 to 4 pressures" application, the boxes installed are "Presscan" and "Viacan."

- **VIACAN** - CAN box for depth and speed sensor
- **PRESSCAN** - CAN box for pressure sensors

To access this menu from the standby screen, press the "BP1" key then select the "Installation" menu using the "BP1" and "BP2" arrows, then confirm your choice by pressing "BP3". ,



Then select the "Can bus test" option using the "BP1" and "BP2" arrows, then confirm your choice by pressing BP3.

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This menu can be very useful for diagnosing any faults that the customer may encounter. For example, in the case of a standard drilling operation with 2 to 4 pressure sensors, the screen should display "VIACAN" and "PRESSCAN." If only Presscan appears on the screen, check the cable connecting the two CAN boxes on the machine and check the Viacan box. If no box appears on the screen, check the cable between the Presscan box and t h e PocketLIM.

DEBUG ON and **CAN1 Baudrate** are diagnostic tools used by LIM technicians and should not be touched.