



### 50kN Load Frame (GDSLF50)

**Overview:** The new GDS 50kN laboratory load frame with standalone keypad operation and USB interface for computer control. The re-designed load frame has enhanced accuracy and features while still complying with the traditional role of a 50kN load frame.

The new GDSLF50 load frame has a large OLED graphic display that shows current speed, displacement and is used for stand-alone programming.

**Standards:**

BS1377:7

BS1377:8

ASTM D-2850

ASTM D-4767

ISO17892-8,9

NFP94 070

**Key Features:**

**Benefits to the User:**

Displacement control:	Traditional load frames only operate in speed/velocity control mode. GDS load frame can also operate in displacement control mode via keypad or software. This is useful for carrying out small strain testing, K0 and creep tests that are difficult to carry out using a frame that is only velocity controlled.
Status indicator:	If the load frame is being used in stand-alone mode the status indicator will show if the frame is running or has paused the test for any error condition such as over-load. For GDSLAB controlled tests the status light can indicate, test over, user intervention required, error condition (such as pore pressure exceeding cell pressure).
Safety loop:	When under computer control the communication is monitored by the load frame such that if communication was lost for whatever reason, the load frame would stop to ensure no damage to sample or transducers can occur.
Closed loop feedback control via transducer:	A load or displacement transducer can be added to the load frame to allow the frame to directly control load or displacement without software involvement. This achieves much greater accuracies of control than “closing the loop via software”.

**Tests that can be Performed:** Triaxial (Quick Undrained, UU, CU, CD), Stress Path, K0, Unsaturated Triaxial, Stepped loading, CRS, CBR and UCS.

**Upgrade Options:** Closed loop load feedback, closed loop displacement feedback, drip tray and swing arm.

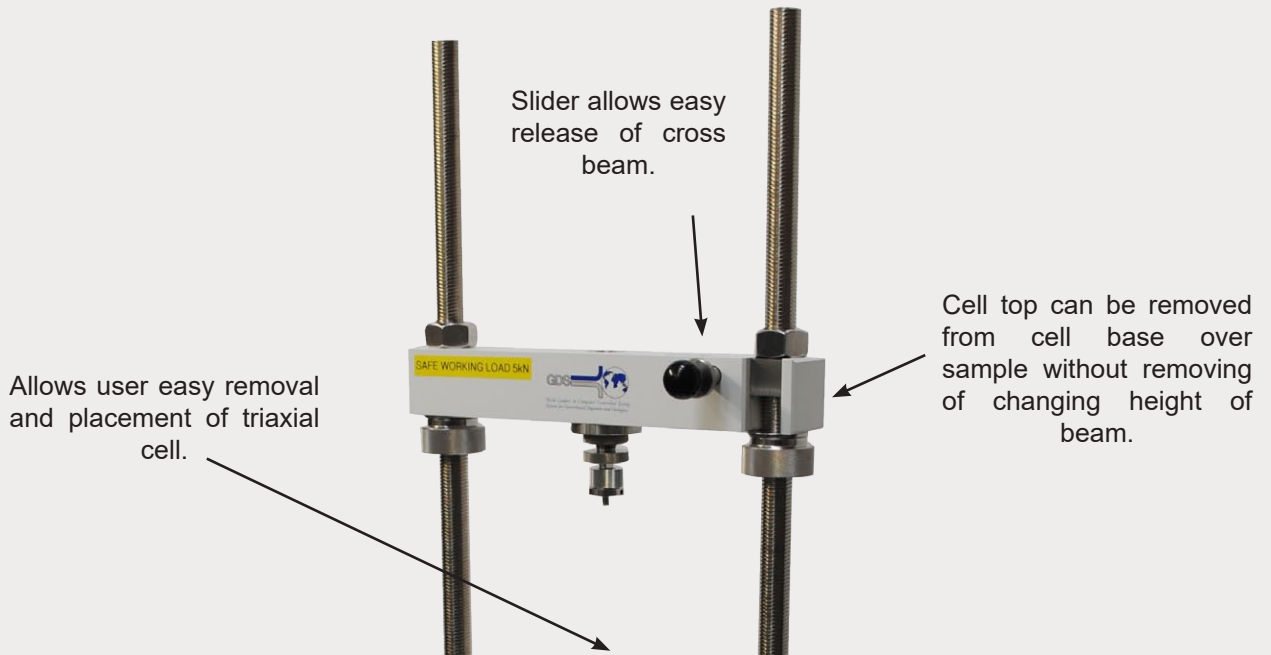
**Technical Specification:**

<b>Maximum Load (Compression) (kN):</b>	50
<b>Maximum Load (Tension) (kN):</b>	15kN Using upper ball connection or 50kN with alternate connection
<b>Speed range:</b>	0.00001mm/min to 89.9999mm/min
<b>Travel (mm):</b>	100
<b>Platen Diameter (mm):</b>	158
<b>Communication port:</b>	USB
<b>Horizontal daylight (mm):</b>	380
<b>Vertical daylight (mm):</b>	800 (crossbeam to platen)
<b>Weight (kg):</b>	95
<b>Dimensions (mm):</b>	475 x 360 x 1430 (w x d x h)
<b>Power:</b>	90-240V, 50/60Hz, single phase

**Upgrade Options:**

- Drip Tray
- Swinging arm

**Swinging Arm**



**Drip Tray**

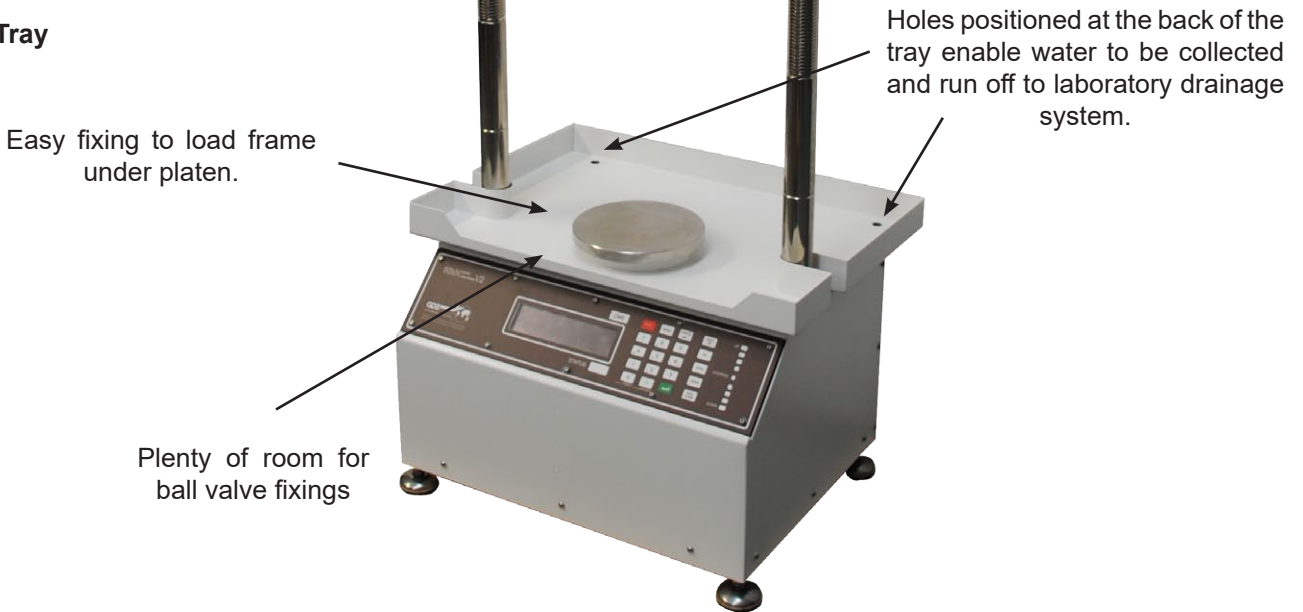


Fig 1. Shows the swinging arm and drip tray options on a GDSL50.

## Optional closed loop feedback control using Digital Remote Feedback Module (Digi RFM)

Typically, velocity controlled load frames are used with no transducer feedback as the velocity is set and considered to be correct (open loop). Using GDSLAB control and data acquisition software the load frame can be controlled under a closed loop via the software (the software reads the appropriate transducer from a data acquisition device, and the software sends commands to the load frame to achieve particular targets for that external transducer). This can work extremely well and allows a velocity controlled load frame to successfully be used for accurate strain controlled tests where the measurement of strain is closer to the sample thus removing system compliance, or load/stress controlled tests as routine.

The next logical level is to create closed loop control of either displacement or load (or both) within the load frame. GDS has developed this into an elegantly engineered enhancement which is the Remote Feedback Module (RFM). The RFM (see Fig 2.) enables the output of a number of external transducers to be measured and displayed by the load frame and via software. It also enables the load frame platen to be controlled directly from the feedback of the external transducer.

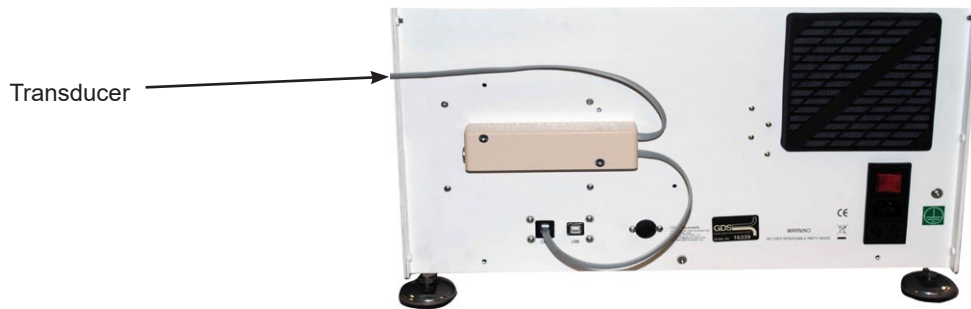


Fig 2. DigiRFM attached to the back of the load frame and connects via the CAN bus/

### Benefits of the DigiRFM include:-

- Precision when regulating from the external transducer due to closed loop control.
- Closed loop control ensures a faster more direct response to load/displacement targets.
- Load control and/or displacement control can be achieved on the load frame in stand-alone mode without the requirement for software.

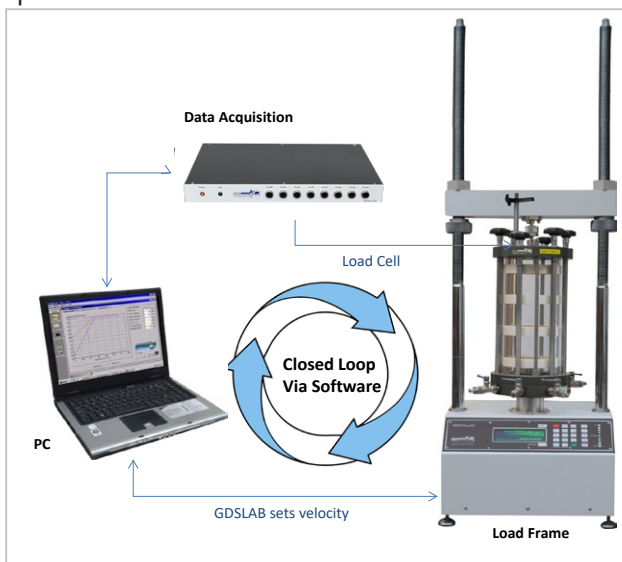


Fig 3. Closed-loop control via software feedback.

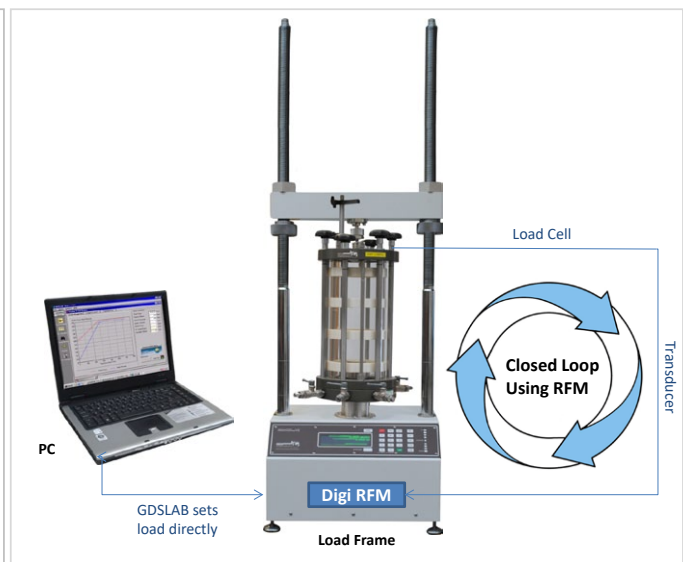


Fig 4. Closed-loop control via RFM feedback.