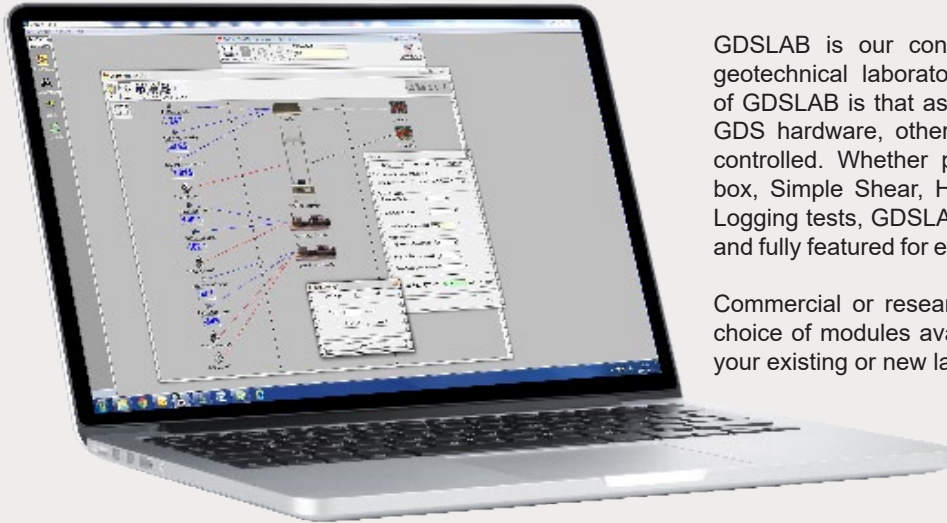


GDSLAB Control and Data Acquisition Software



GDSLAB is our control and data acquisition software for geotechnical laboratory applications. The main advantage of GDSLAB is that as well as the ability to control all existing GDS hardware, other manufacturers' hardware can also be controlled. Whether performing Triaxial, CBR, Direct Shear box, Simple Shear, Hollow Cylinder or simple Consolidation Logging tests, GDSLAB remains intuitive, flexible, easy to use and fully featured for even the most complex or advanced tests.

Commercial or research testing is possible within the broad choice of modules available. GDSLAB can be integrated with your existing or new laboratory equipment.

Key Features:

Benefits to the user:

Flexibility in the way the software is purchased	Only the test modules required need to be purchased. In this way, those customers performing just the simpler tests have the opportunity to reduce their software costs. Additional modules can be remotely added at any time in the future.
Multiple stations can be connected to the same PC	Allows for tests on individual stations to be independently performed with the advantage that hardware can be shared between stations (sharing channels of a datalogger for example).
One software solution for your test control	Triaxial, Oedometer, Consolidation, Shear, Hollow cylinder, static or dynamic, GDSLAB provides test modules for all of these tests. Having the same familiar user interface for all tests means that the user will find the software familiar whether running a multi-stage oedometer test, or a complex multi stage dynamic simple shear test on a cyclic shear machine.
Compatible with every GDS product since 1979	Complete confidence in the GDS ethos that your equipment will never go out of date.
Compatible with key hardware from other manufacturers (loggers, load frames etc)	It is often possible to create a fully automated system using existing equipment in the laboratory and minimal new hardware. E-mail details of your existing equipment to the sales team to start the discussion.
Batching of multiple tests	GDSLAB enables the user to setup multiple test stages, either before commencing testing or at any point during testing. Test stages can be paused, stopped or resumed at any point in time. Test stages can also be set to stop automatically on a number of user defined criteria e.g. max deviator stress during a shearing stage.
ASCII data file for easy data recovery and processing	Data is saved to a data file in ASCII format at a user specified time interval. This time interval can be on a linear, square root or log scale. Both the raw data and all the calculated data can be saved to the ASCII datafile.
Change graph axes and live test data viewed 'on the fly'	All measured and calculated data can be displayed graphically in real-time on up to three graphs. The user can choose what data to display on the graph axes before and during a test and can change these at any time to suit the user. GDSLAB measures the values of all transducers connected to the system constantly and uses these values to calculate all relevant stresses, strains and displacements. Live data displayed may be configured by the user.
Intuitive graphical hardware configuration and transducer setup	GDSLAB has a unique 'hardware display' window that can be viewed at any time. This window displays all of the hardware connected to the PC, how it is connected, it's current status and current readings. This is essential a graphical display of the hardware and allows for simple diagnostics and checking of the hardware connected, as well as calibration of each device.

Required PC Specification:

Operating System:	Windows XP or higher (Windows 10 preferred)
PC Spec Hardware:	2GHz / 4GB Ram Note: Free serial ports /USB ports as required for individual hardware connection.

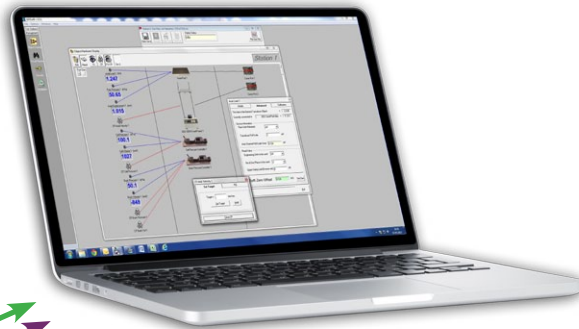
How do you use it?

GDSLAB is a modular program that is initially purchased as a Kernel, or 'core' program. This kernel is the initial framework for GDSLAB, and includes data acquisition capability for all devices that GDSLAB has a driver for (all GDS hardware plus a number from other manufacturers). It is enabled by use of a USB key which resides in the PC.

Optional test modules are then purchased as 'Add-ins' to bring to the software the ability to control the hardware for particular tests. Test modules integrate fully into GDSLAB to form a single combined program adding further functionality to the Kernel. Each Test Module is purchased according to the type of test you will be performing therefore only the desired test modules need to be purchased thus keeping the cost to a minimum. Additional test modules may be added to the package at any time in the future when required, by simply updating the USB kernel key, which can easily be done remotely.

Categories of tests are shown below (Triaxial testing, Oedometer logging, Consolidation, Shear testing, Hollow Cylinder). A full list of the test modules currently available can be found on the following pages of this datasheet.

Start with our core GDSLAB Kernel...



... add in the modules for
your specific task:

Triaxial Testing

Oedometer Logging

Consolidation

Shear Testing

Hollow Cylinder

Triaxial Testing Software Modules

Available Triaxial Testing modules are as follows:

- **Data Acquisition, Logging and Retrieval:**
Provided free of charge with every GDSLAB kernel. Provides all data related functions but not test control.
 - **Saturation & Consolidation Procedures:**
Cell and back pressure control for saturation, (stepped or ramp), consolidation and B-check tests.
 - **Standard Triaxial Testing:**
Constant rate of strain control for unconsolidated undrained (UU), consolidated undrained (CU) and consolidated drained (CD) shearing tests.
 - **Stress Path Controlled Tests:**
Independent linear control of p, q or s, t stress space with unlimited number of linked paths.
 - **Advanced Loading (User Defined Test Sequences):**
Independent user control over the axial (load, stress or strain), radial and back pressure axes with control options of constant value, ramp or quasi-static sinusoidal cyclic applied separately to each axis.
 - **K-zero Controlled Consolidation/Swelling:**
Maintains zero diameter change (K0 conditions) by two methods, either from a direct reading of the specimen diameter or using specimen volume change calculations.
 - **Triaxial Permeability Evaluation:**
Controls either a constant head permeability test, or a constant flow permeability test with controlled hydraulic gradient control.
 - **Unsaturated Tests using Axis Translation - 4D Stress/Strain Path:**
Independent control of the axial axis (load, stress or strain), radial stress, pore water pressure and pore air pressure for complete flexibility of control for unsaturated triaxial tests.
- Dynamic Triaxial Tests**
- High speed dynamic cyclic triaxial testing with high speed data acquisition. Test control of dynamic axial load or axial displacement, with static cell and back pressure control. Dynamic control of axial stress and/or radial stress is available dependant on hardware.

Oedometer Logging Module

Uses a datalogger and displacement transducers to take settlement readings from hanging weight oedometer frames.

- **Hanging Weight System (Oedometer Logging):**
This module allows a user to measure and log results from the hanging weight testing system according to user specified sequence events such as linear, square-root, log.

Consolidation Software Module

GDS manufacture the Rowe and Barden consolidation cell (hydraulically actuated normal load), and a Constant Rate of Strain (CRS) type cell which is loaded via a load frame. Our flexible software is compatible with both systems.

- **Standard Consolidation:**
This test module allows the user to perform; B-check, saturation, constant stress, traditional stepped loading test, constant rate of strain and constant rate of loading tests. Versions of our consolidation cells are available that allow unsaturated tests to be performed using the axis translation technique.

Shear Testing Software Modules

At GDS Instruments we lead the market with our range of direct shear and direct simple shear testing systems. Our software has been developed to allow our customers to fully utilise their devices with a range of tests.

- **Shear Testing (Standard):**
Generally used with direct shear or ring shear devices. Provides acquisition only or control where hardware permits for linear or linear cyclic reversal of a shear box or a ring shear machine. Ideal for upgrading manually logged equipment.
- **Shear Testing (A Drained):**
Independent control over the axial axis (load, stress or strain) and shear axis (load, stress or strain) with constant, ramp or quasi-static sinusoidal cyclic control on either axis. Unsaturated tests may be performed using the axis translation technique.

- **Dynamic Shear Testing:**

High speed dynamic cyclic simple shear testing with high speed acquisition. Test control of dynamic axial and shear axes under load or displacement. Allows modulus, damping and liquefaction studies to be carried out.

Hollow Cylinder Software Modules

The GDS Hollow Cylinder Apparatus (HCA) allows a hollow cylindrical soil specimen to be simultaneously subjected to axial loading and twisting (torque).

- **HCA Generalised Stress Path**
Provides independent linear control of p , q , b and α under stress or strain control. This module provides the fundamental HCA stress path control functions that test specifications demand, with unlimited number of linked paths.
- **Advanced HCA Loading Procedures:**
Allows quasi-static independent control of the five axes; Axial (load, stress, strain, deformation), Rotational (torque, rotation), Outer Cell pressure (kPa), Inner Cell pressure (kPa) and Back pressure (kPa) using either constant, ramp or slow speed sinusoidal control.

- **Dynamic HCA Loading:**

High speed dynamic cyclic testing with high speed data acquisition. Test control of dynamic axial load or displacement, and dynamic control of torque or rotation. Optional dynamic control of inner and outer cell pressures depending on system specification.

Test Display

The test display focuses around a window which displays live graphs and live test data. Both the graphs plotted and live test data may be selected and changed 'live' during the test. Additional windows may then be positioned to give further test information. In the example below, a number of additional windows are shown (see Figure 1).

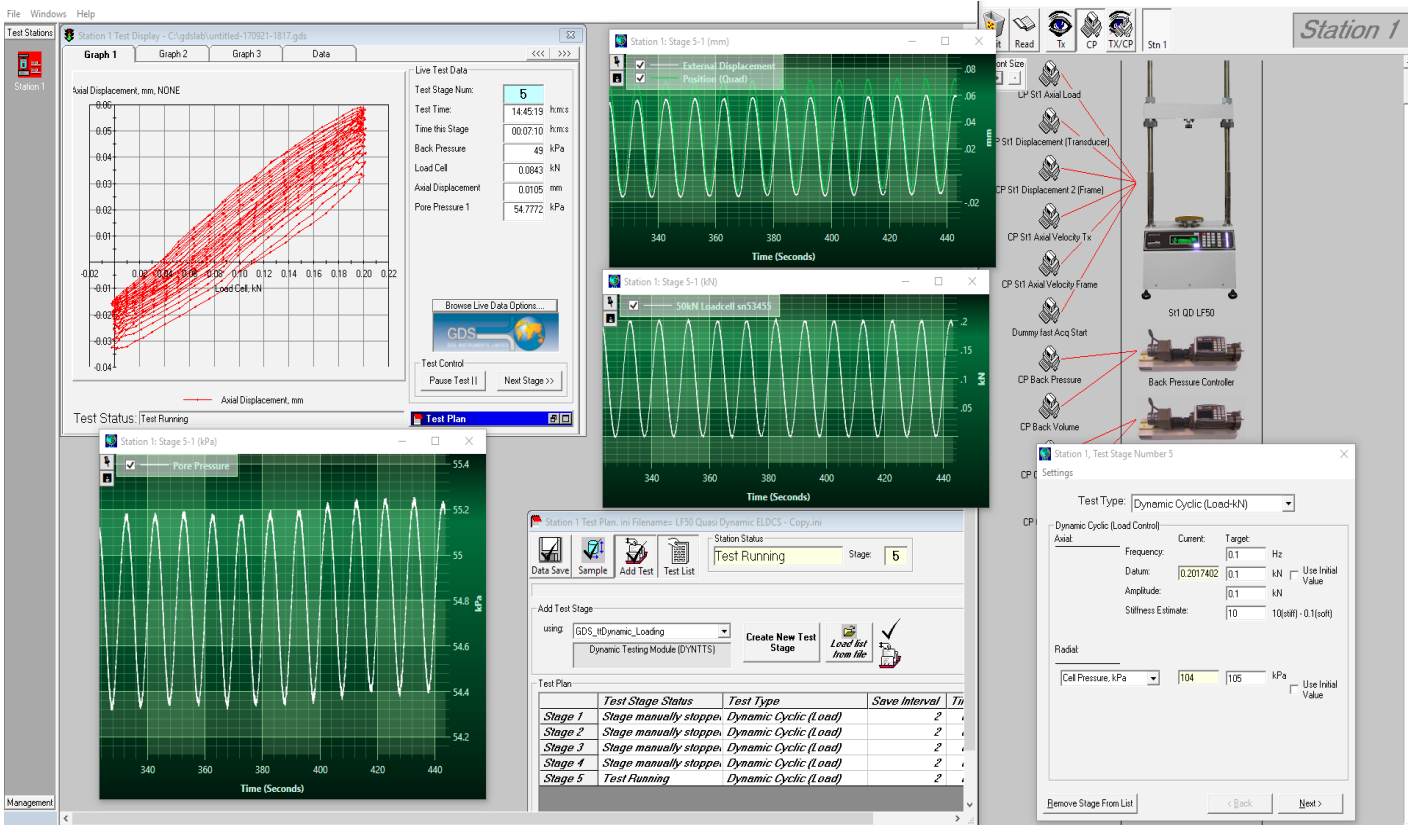


Fig 1. Test in progress windows

- Test Plan Window. This shows which test stage is running, and allows additional tests to be added to the test plan at any time.
- Real time graphs (shown in green). When running a cyclic test with fast data acquisition, scrolling windowed graphs show each parameter to ensure the real-time live data for each parameter can be clearly seen, rather than looking at data from the start of the test as shown in the Test Plan Window.
- Details of the current test stage such that the user input details may be reviewed.
- The hardware display may be visible such that the hardware status can be seen at a glance.

Hardware Display – an intuitive user interface for system set up, checking and calibration

By clicking on any of the devices within the hardware/object display, information about the device will appear in a new window. Depending on the hardware arrangement, this may simply be an information box, a box where communications (comms) settings must be entered (e.g. RS232 or IEEE parameters), or detailed information about the device setup.

Clicking on the “EYE” icon (the eye represents a transducer, or any device that can be read) will bring up the transducer details for that particular device. Specific transducer details are then entered in the ‘advanced’ tab such as Transducer Full Scale, Decimal Places and Transducer Upper Limit. The ‘calibration’ tab is then used where either the transducer sensitivity is entered, or a full calibration is performed.

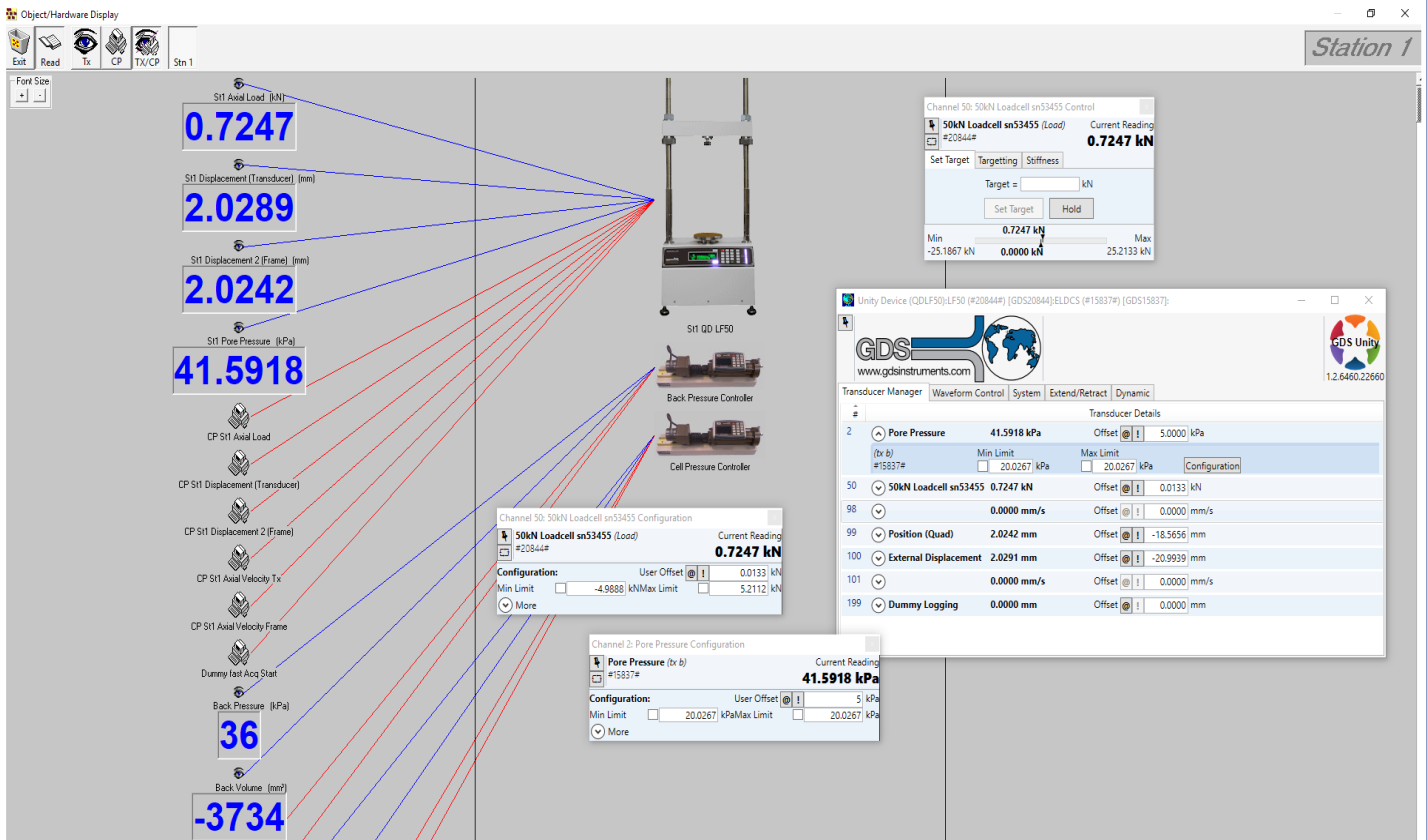


Fig 2. Hardware display window

Upgrade path for hardware from other manufacturers

GDSLAB requires a hardware device driver for each piece of hardware being configured within the system. Hardware device drivers are available free of charge for all hardware already supported by GDSLAB, and are installed on the users PC by default when GDSLAB is installed.

Hardware drivers are constantly being added as hardware is developed by GDS and other manufacturers. For an up to date list of the hardware currently supported by GDSLAB, or if you wish to have your device included on a GDSLAB drive in the future, do not hesitate to contact GDS on support@gdsinstruments.com.

Why buy GDSLAB?

- Well developed GDSLAB software provides a consistent interface across all of your geotechnical laboratory testing
- You are able to choose particular test modules for your testing requirements or your International Standard requirements
- GDS is now supporting a single piece of software (GDSLAB) for all laboratory products. This means that the testing quality will be dependent on the hardware attached, not the software
- ‘Future proof’ software as new test modules are added and device drivers are created when new hardware is produced by OEM’s

Why Buy GDS?

GDS have supplied equipment to over 75% of the world's top 50 Universities:

GDS have supplied equipment to over 75% of the world's top 50 Universities who specialise in Civil & Structural Engineering, according to the "QS World University Ranking 2017" report.

GDS also work with many commercial laboratories including BGC Canada, Fugro, GEO, Geolabs, Geoteko, Golder Associates, Inpijn Blokpoel, Klonn Crippen, MEG Consulting, Multiconsult, Statens Vegvesen, NGI, Ramboll, Russell Geotechnical Innovations Ltd, SA Geolabs, SGS, Wiertsema and Partners to name a few.

**TOP
50**

Would you recommend GDS equipment to your colleague, friend or associate?

100% of our customers answered "YES"

Results from our post-delivery survey asked customers for feedback on their delivery, installation (if applicable), supporting documentation, apparatus and overall satisfaction with GDS. The survey ran for two years.



Made in the UK:

All GDS products are designed, manufactured and assembled in the UK at our offices in Hook. All products are quality assured before they are dispatched.

GDS are an ISO9001:2015 accredited company. The scope of this certificate applies to the approved quality administration systems relating to the "Manufacture of Laboratory and Field Testing Equipment".

**40 YEARS OF
BRITISH
INNOVATION**



Extended Warranties:

All GDS apparatus are covered by a 12 month manufacturers warranty. In addition to the standard warranty, GDS offer comprehensive extended warranties for 12, 24 and 36 months, for peace of mind against any repairs in the future. The extended warranties can be purchased at any time during the first 12 months of ownership.



GDS Training & Installation:

All installations & training are carried out by qualified engineers. A GDS engineer is assigned to each order throughout the sales process. They will quality assure the apparatus prior to shipping, if installation has been purchased, install the apparatus on the customers site & provide the training.



Technical Support:

GDS understand the need for ongoing after sales support, so much so that they have their own dedicated customer support centre. Alongside their support centre GDS use a variety of additional support methods including remote PC support, product helpsheets, video tutorials, email and telephone support.

