GDS
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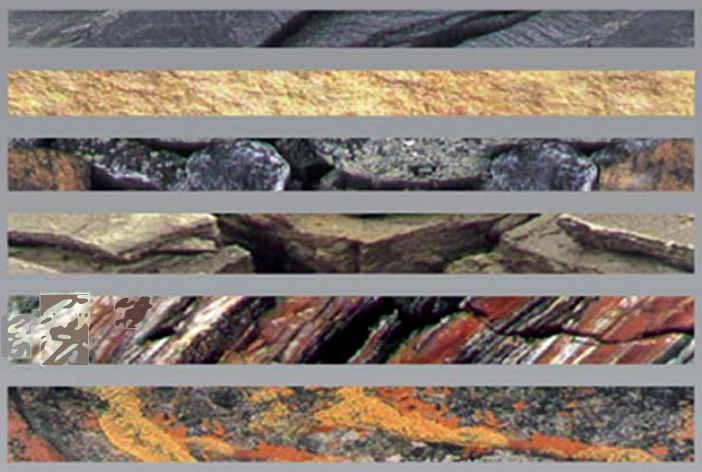
World Leaders

in | Software Based Geotechnical Testing Systems

for | Laboratory & Field



Software Brochure: Core Software Modules

GDSLAB: The Ultimate in Flexibility

Our laboratory software package, GDSLAB, starts with a core application known as the kernel. The GDSLAB kernel allows for data acquisition from your hardware, but no test control. Simply add the appropriate module or modules to complete the test suite functionality you require.

Triaxial Testing Software Modules

GDS are world leaders in dynamic and static PC controlled triaxial testing. We have an extensively developed range of software modules to complement these systems.

- **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.

Start with GDSLAB

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your spe

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- Oedomet
- Consc
- Shear
- Hollow

Notes:
1) Software module desc
are outlines of what each
has sophisticated choices
control options that are
handbook (available on re
2) While one GDSLAB kern
modules are purchased
enabled on all site kernels

- Allows your existing hardware to be upgraded to PC control.
- Compatible with every GDS product since 1979.
- Compatible with key hardware from other manufacturers (loggers, load frames etc).

our core kernel...

e modules for ecific task:

- l Testing
- er Logging
- lidation
- Testing
- Cylinder

iptions in this brochure module does. Each module for termination conditions and explained further in the user quest).
el is required per PC, test s site licenses and therefore

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 Procedures:**
  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.

- **Direct Shear Box Control:**
  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.
- **Advanced Direct and Direct Simple Shear Module:**
  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 Simple Shear:**
  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 alpha 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 axial displacement, and dynamic control of torque or rotation. Optional dynamic control of inner and outer cell pressures depending on system specification.

GDS Product Specific Software

GDSLAB Reports:

This program is used to present triaxial, oedometer and other laboratory data saved in either a GDSLAB data file, or input by hand. Compatible with some dataloggers from other manufacturers, it is designed to present data to the National Standard BS 1377:1990. Reports are output directly into Microsoft Excel and therefore the layout can be easily edited by the user.

GDSBES Bender Elements:

The GDS Bender Element Software (BES) provides an excitation signal to the source element of sine, square, or user defined waveform. The acquired data from the receiver element is displayed on screen, and the software provides a range of helpful functions to enable the user to successfully 'pick' the trace and calculate the travel time between elements.

GDSRCA Resonant Column:

The GDSRCA software is used for control and data acquisition of the Resonant Column Apparatus. Test capabilities include automation of resonance in torsion, resonance in flexure, damping by free vibration in torsion and flexure, and slow speed torsional shear (TS) tests.

SASW Spectral Analysis of Surface Waves:

This software is written for use with the GDS Spectral Analysis of Surface Waves system. It has a multitude of functions including stacking (in time or frequency domain), trigger input (electrical or manual), Fast Fourier transform with display of phase, magnitude and coherence functions and enables the user to view during a test the dispersion curve created.

CSWS Continuous Surface Wave system:

Written for use with the GDS Continuous Surface Wave system. The user enters a range of frequencies for the test, and the software will precisely regulate the inertial vibrator at each specified frequency, while automatically producing a dispersion curve by performing a Fast Fourier Transform on the data at each frequency. Time domain and frequency data may be saved.

Support and Maintenance of Your GDSLAB and Software Modules

All our software comes with a 12-month free support package to give you any assistance you might need when using your new software. Please call us on +44 (0) 1256 382450 for more information.

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