

Automatic Oedometer System (GDSAOS) (One Dimensional Consolidation)

The GDS Automatic Oedometer System (GDSAOS) is the modern replacement for a traditional hanging weight oedometer. The GDSAOS is a self-contained stepper motor driven unit that can be controlled either manually using its Smart Keypad or from a PC using the USB interface. There is no requirement for compressed air or manually placed weights. When used with the GDSLAB control and data acquisition software, the GDSAOS can be used for a complete array of tests beyond those which a hanging weight oedometer can perform.

Key Features:

Benefits to the User:

Automatic transition between test increments for all soil types, with no need of user estimated parameters input during test set-up:	Results from tests on over consolidated clay, produced a reduction in test duration of 42%.
Direct replacement for a hanging weight oedometer system:	The GDSAOS is a stand-alone unit (with no requirement for compressed air). Having a small footprint significantly reduces the bench space required coupled with the additional advantage that loading weights are not required.
Automated logging of data (and optionally reporting):	Automation saves time recording results and controlling the test.
Incremental loading stages:	When using GDSLAB the GDSAOS can be preprogrammed to include numerous incremental loading stages which automatically move to the next stage via preprogrammed end of consolidation conditions, thus increasing sample throughput.
Accurate results throughout the load range:	From 1N to 10kN the GDSAOS electro-mechanical pressure controlled systems provide accurate results, compared to pneumatic consolidation systems that are typically inaccurate at low loads.
Utilise existing equipment:	If upgrading from a PC logged hanging weight system, it may be possible to utilise the current consolidation cells, transducers and data loggers. Many data loggers, even those from other manufacturers, are compatible with the GDSLAB software.

Technical Specification:

Axial Force Accuracy:	0.1%FRO
Dimensions:	W/D/H - 220mm, 260mm (including keypad), 656mm
Displacement Accuracy:	0.2% (Can be improved to 0.1% with an external transducer connected to an RFM)
Displacement Resolution:	0.0001mm (0.1µm)
Displacement Range:	Nominal 40mm
Load Range:	10kN (Using Standard load frame, horizontal daylight 184mm)
Power:	110 to 240 AC Volt Input, 60Watts, 50/60Hz
Sample Size:	50, 63.5, 70, 100mm

Optional Extras:

Wide Load Frame: (Horizontal daylight 224mm)	10kN
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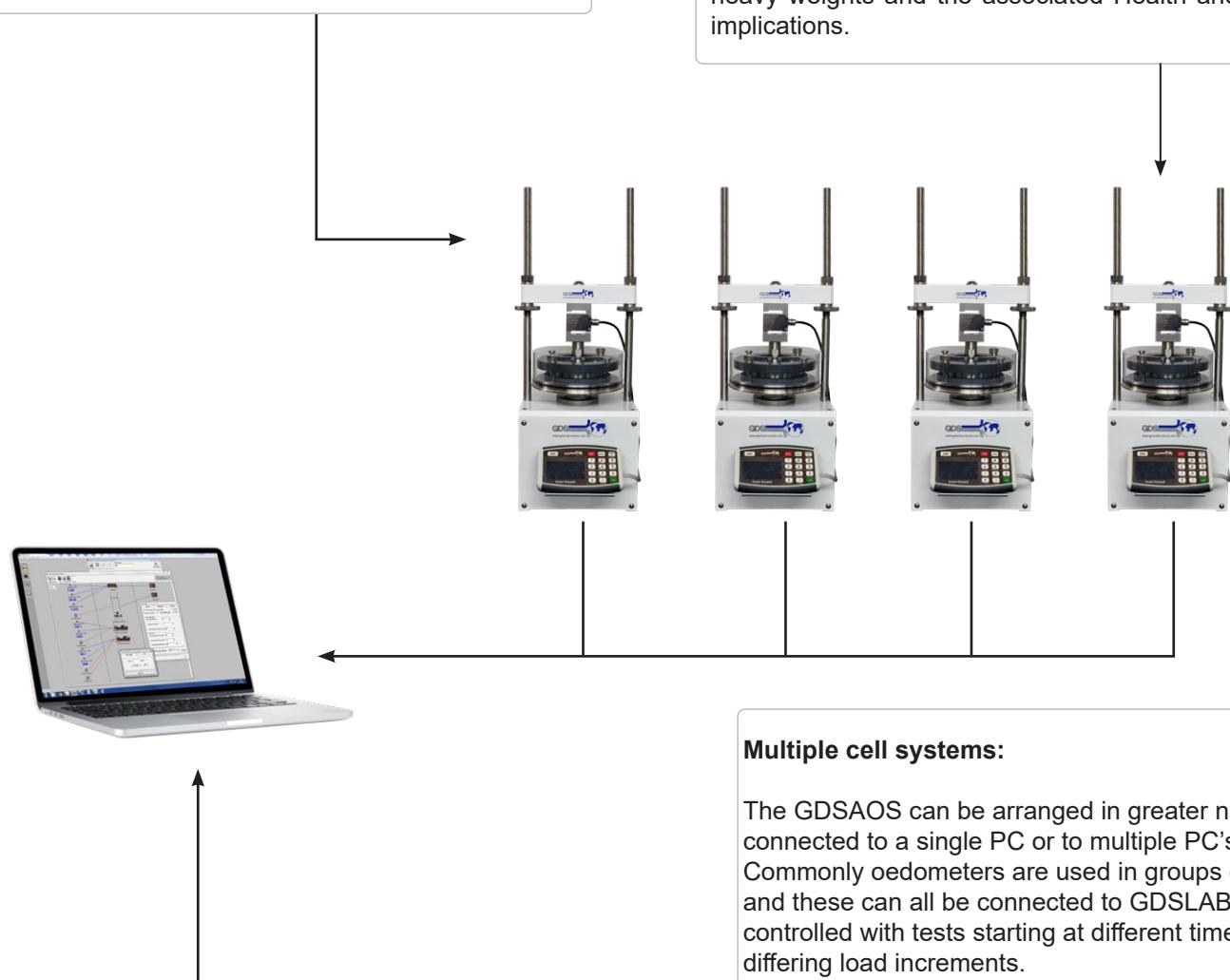
Fig 1. Standard Oedometer test setup

No Hanging Weights

In its simplest form, the GDSAOS frame with oedometer cell provides a force control unit with displacement measurements taken from the platen movement. In this way it can be used as a direct replacement for a traditional hanging weight oedometer frame.

Loading

Loading can be applied directly through the keypad with measured load and measured displacement recorded manually as with a traditional oedometer frame. This simple method may be applicable to teaching laboratories and avoids students handling heavy weights and the associated Health and Safety implications.



GDSLAD Software: Fully Automated Control & Acquisition

The greatest benefits of the GDSAOS are realised when the apparatus is fully automated for control and acquisition with the following options:

- GDSLAD with the Oedometer module – Automated testing (step loading) and data acquisition.
- External Displacement transducer – Increases the accuracy of strain measurements (generally required to comply with national standards). The recommended transducer is a USB digital dial gauge for simplicity, ease of use, and the reassurance of a reading on the transducer.

Multiple cell systems:

The GDSAOS can be arranged in greater numbers connected to a single PC or to multiple PC's. Commonly oedometers are used in groups of 4-6 and these can all be connected to GDSLAD and controlled with tests starting at different times and differing load increments.

Note: If upgrading from a PC logged hanging weight system, it may be possible to utilise the current data logger and transducers as many data loggers, even those from other manufacturers, are compatible with the GDSLAD software.

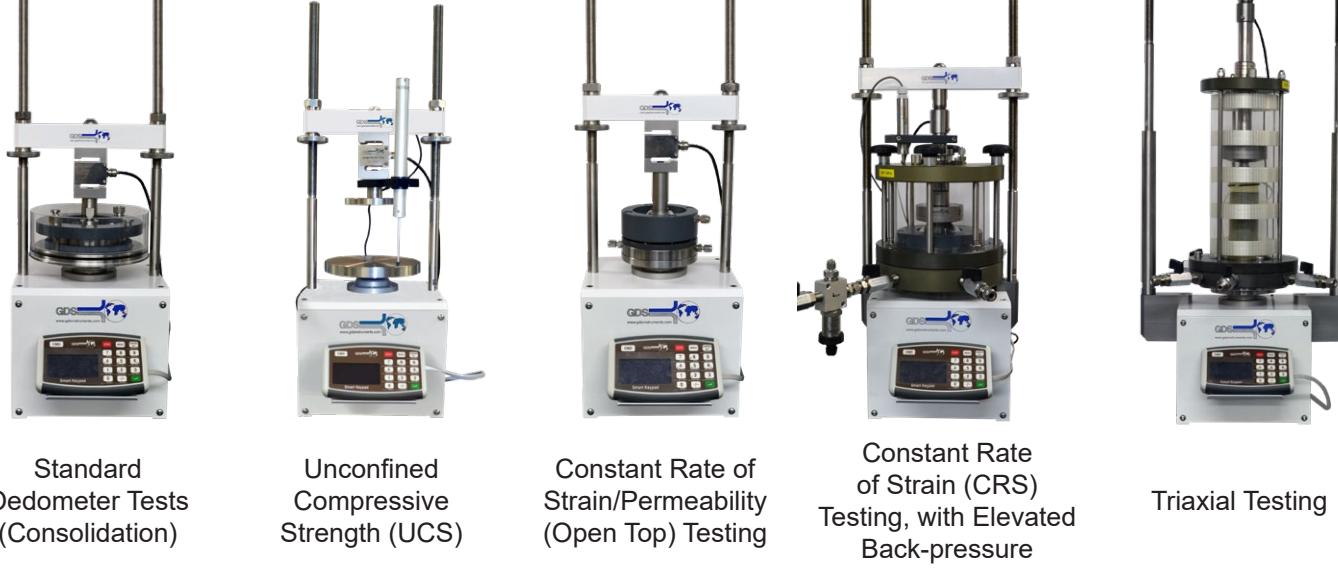
10kN Load Frames:

The (standard) 10kN load frame used for GDSAOS testing can be upgraded to perform additional tests. See table below.

GDS have a range of three 10kN load frames all of which, can perform GDSAOS testing. Each frame has a range of testing capabilities which, has been documented below.



Testing Options:	Standard	Wide	Wide and Tall
Standard Oedometer Tests:	✓	✓	✓
Unconfined Compressive Strength:	✓	✓	✓
Constant Rate of Strain / Permeability (Open Top) Testing:	✓	✓	✓
Constant Rate of Strain (CRS) Testing, Elevated Back-pressure:		✓	✓
Triaxial Testing (Max cell size 76mm):			✓
Dimensions of Frame (W/D/H):	220mm, 260mm (including keypad), 656mm	260mm, 260mm (including keypad), 668mm	352mm, 260mm (including keypad), 956mm
Horizontal daylight between columns:	184mm	224mm	299mm
Vertical daylight between top-beam and platen*:	380mm	395mm	600mm
Vertical daylight between 10kN S-beam load cell button and the platen*:	270mm	285mm	490mm
Frame Reference:	004	001	003



Standard
Oedometer Tests
(Consolidation)

Unconfined
Compressive
Strength (UCS)

Constant Rate of
Strain/Permeability
(Open Top) Testing

Constant Rate
of Strain (CRS)
Testing, with Elevated
Back-pressure

Triaxial Testing

GDS have supplied equipment to over 86% of the world's top 50 Universities:

GDS have supplied equipment to over 86% of the world's top 50 Universities who specialise in Civil & Structural Engineering, according to the "QS World University Ranking 2020" report.

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



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".



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.

