

USB 8 Channel Logger (PAD)



Overview: The USB 8 channel logger is a 24 bit digital acquisition system developed specifically for use with transducers likely to be used in a geotechnical laboratory. Most commonly used for low sample rate acquisition (1Hz or less) on all of the GDS static testing systems.

The device provides eight fully independent channels of simultaneously sampled ultra-high resolution 24-bit data. Each channel has 22 software selectable gain ranges, precision ratiometric transducer excitation, and industry standard DIN connectors allow the full-range of GDS

transducers to be quickly and easily connected and configured.

A standard USB Interface provides direct PC connectivity and is fully supported by the GDSLab test software allowing seamless integration into new and existing test setups. With the ability to connect multiple USB Pads per PC it is possible to build, expand and customise data acquisition systems by using multiple devices to suit requirements.

Technical Specification:

Connection to PC:	USB
Acquisition Channels:	8
Multi Box Capability:	x10
Max Number of Channels:	Up to 80
Sample Rate:	1Hz
Resolution:	24 Bit: 16,777,216
Gain Ranges:	22 (User defined in software)
Voltage Resolution:	~ 0.000003 mVolts (3 nanovolt) at +/-22mV range
Voltage Input Type:	Fully Differential, Balanced Precision Inputs with Integrated Signal Conditioning
Transducer Excitation Voltage:	Differential, Fixed Precision +/-5V, Independent (not Ganged), Ratiometric Excitation
Input Ranges:	22 Independently Selectable Ranges Per Channel from (-22...+22mV) to +/-23.5V
Excitation Current Sense:	Yes - can monitor transducer currents - alerts user of disconnected transducers
Excitation/Transducer Fault Detection:	Overvoltage, Overcurrent, Absent Transducer
Excitation Fault Tolerance:	Independent Per Channel, if any channel is shorted the other channels will continue to operate normally
Transducer Calibration:	Linear
Data Acquisition Options:	Digital filtering for noise reduction
Display and Monitoring:	Data acquisition in GDSLab via USB interface
Software:	GDSLAB v.2

ELDCS Acquisition Pad



Overview: The ELDCS is our Enterprise level Analogue Acquisition and Control System designed for mid range dynamic testing and control. The ELDCS has been fully designed and developed by GDS' in-house engineering team and fits neatly as a lower cost version of the ADVDCS v2, with many of the same features that would be expected from a high level dynamic control system, but with a more economical price point.

The ELDCS provides 4 channels of ultra-high resolution 24-bit data and a single additional incremental quadrature input channel. The 4 channels of fixed-gain inputs can be customised at the factory to enable any transducer in the GDS range to be connected via the industry standard DIN connector. Multiple ELDCS boxes can be joined via the CAN connector to provide synchronised data acquisition and control.

A standard USB Interface provides direct PC connectivity and is fully supported by the GDSLab Test Software allowing seamless integration into new and existing test setups.

Technical Specification:

Connection to PC:	USB
Acquisition Channels:	4 Analogue + 1 Quadrature Decoder
Control Channels:	1 Analogue
Multi Box Capability:	x4
Max Number of Channels:	Up to 16 analogue + 4 quadrature channels with synchronised data acquisition
Sample Rate:	500Hz
Resolution:	24 bit, 16,777,216
Gain Ranges:	8 (preconfigured at factory)
Description:	Enterprise level solution for dynamic acquisition and control.
Voltage Resolution:	~ 0.000001 mVolts (1 nanovolt)
Voltage Input Type:	Fully Differential, Balanced Precision Inputs with Integrated Signal Conditioning
Transducer Excitation Voltage:	Differential, Fixed Precision +/-5V, Independent (not Ganged), Ratiometric Excitation
Number of Input Ranges:	Pre-Configured Single Fixed Gain per Channel. Each channel can be individually customised at the factory to meet application requirements from +/- 10mV to +/- 10V. Standard setup is 1 channel +/-10V, 2 channels +/- 200mV, 1 channel +/- 30mV.
Excitation Fault Tolerance:	Independent Per Channel, if any channel is shorted the other channels will continue to operate normally
Current Input Mode:	Yes - Via resistor fitted in cable termination (different ranges possible)
Differential Measurement Range:	-10mV...+10mV to -10V...+10V for balanced differential signals
Transducer Calibration:	Linear
Data Acquisition Options:	Digital filtering for noise reduction
Digital Control:	500 Hz 32-bit floating point control loop
Analogue Control:	Support for Analogue motor drives only
Compliance Estimation:	Set by user
Adaptive Control:	Cycle-by-Cycle Reference Adaptation
Custom Waveforms:	Repetitive custom waveforms with 256 points per cycle. Waveform streaming direct from file. (Upgrade option, upon purchase).
Sample Docking:	Manual
Display and Monitoring:	Data acquisition in GDSLab via USB interface, High resolution real time graphs
Software:	GDSLAB
System Characteristics:	40MHz 16-Bit Digital Signal Controller with Analogue Control Outputs
Minimum System Requirements:	OS: Windows 7 or later, CPU: 1.5 GHz or higher, Memory: 2 GB, USB 2.0

ADVDCS v2 Acquisition Pad



Overview: The ADVDCS v2 is a modern high speed digital control and acquisition system developed especially for geotechnical testing, and is the premier device in the GDS range, typically supplied with our most advanced dynamic test and control systems. The ADVDCS v2 has been fully

designed and developed by GDS' in-house engineering team.

The ADVDCS v2 is based around a modern, high speed, 32 bit processing core and has eight simultaneous sampling 24 bit universal analogue input channels, enabling any transducer in the GDS range to be connected. High speed digital bus technology allows real-time streaming of transducer data making it ideal for high speed data acquisition. The ADVDCS v2 supports full digital control of servo motor and hydraulic actuators allowing accurate, precise and noise free control of actuators.

The ADVDCS v2 is the direct result of GDS research into high accuracy dynamic control, and contains machine learning algorithms that adapt in real-time to dynamic changes in sample compliance thereby delivering excellent control over the full machine performance envelope.

Technical Specification:

Connection to PC:	USB
Acquisition Channels:	8 Analogue + 1 Quadrature Decoder
Control Channels:	2 (Analogue or digital)
Multi Box Capability:	x4
Max Number of Channels:	Up to 32 analogue + 4 quadrature channels with synchronised data acquisition
Sample Rate:	5kHz
Resolution:	24 bit, 16,777,216
Gain Ranges:	8 (User defined in software)
Description:	Advanced level solution for the highest performance of dynamic acquisition & control
Voltage Resolution:	~ 0.000001 mVolts (1 nanovolt)
Voltage Input Type:	Fully Differential, Balanced Precision Inputs with Integrated Signal Conditioning
Transducer Excitation Voltage:	Differential, Fixed Precision +/-5V, Independent (not Ganged), Ratiometric Excitation
Number of Input Ranges:	8 Independently Selectable Ranges Per Channel from (-10...+10mV) to (-10...+10V)
Excitation Current Sense:	Yes - can monitor transducer currents - alerts user of disconnected transducers
Excitation/Transducer Fault Detection:	Overvoltage, Overcurrent, Absent Transducer
Excitation Fault Tolerance:	Independent Per Channel, if any channel is shorted the other channels will continue to operate normally
Current Input Mode:	Yes - Via resistor fitted in cable termination (different ranges possible)
Differential Measurement Range:	-10mV...+10mV up to -10V...+10V for balanced differential signals
Transducer Calibration:	Linear, polynomial and custom transducer calibration
Virtual Transducers:	Up to 32 virtual transducers (e.g. strain, compliance, calculated values)
Data Acquisition Options:	Digital filtering for noise reduction
Digital Control:	1 kHz 32-bit floating point control loop
Analogue Control:	Control of both digital and analogue motor drives possible
Compliance Estimation:	Real time specimen compliance estimation
Adaptive Control:	Adaptive load and stress control
Custom Waveforms:	Custom waveform control with a maximum of 16000 points per waveform
Sample Docking:	Automatic sample docking
Display and Monitoring:	Data acquisition in GDSLab via USB interface, High resolution real time graphs
Software:	GDSLAB
System Characteristics:	200 MHz dual core ARM Cortex-M4 CPU, 32-bit architecture, On-board flash memory, 480 Mbit/s USB connection
Minimum System Requirements:	OS: Windows 7 or later, CPU: 1.5 GHz or higher, Memory: 2 GB, USB 2.0

Optional: Digital Remote Feedback Module (Digi RFM)

DigiRFM's can provide an additional single channel of data acquisition. They can be added to standard and advanced controllers (Not compatible with Enterprise) and GDS' range of load frames. The DigiRFM's can also be used to provide closed loop communication with GDS load cells and displacement transducers.

How They Work

Normally, the feedback to the main control circuit board comes from the internal pressure transducer. However, this input could come from a different source, such as a remote transducer. GDS has developed this into an elegantly engineered enhancement which is the Remote Feedback Module (RFM).

The RFM (see Fig.1) enables the output of an external transducer to be measured and displayed by the controller. It also enables the piston action to be controlled from the feedback of the external transducer. Both the internal pressure transducer and the external transducer readings are displayed and transmitted over the computer interface. Benefits of the Digi RFM include:-

- Precision when regulating from the external transducer, as it can be positioned closer to the experiment.
- Can increase the accuracy of the application by choosing a transducer closer to the range of the experiment.
- Can be used with wet wet differential pressure transducer to increase the accuracy and measurement, e.g. for precise control between back pressure and cell pressure for accurate measurement and control of effective stress.



Fig. 1 Optional Digi RFM

Why Buy GDS?

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.

**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.

