INSTRUCTION MANUAL

Strain Gauge Load Cell
SGLC-7000 / SGLC-7050

GEOSENSE

UK CA CE

TABLE OF CONTENTS

1. VERSION CONTROL

Version	Date	Author	Approved	Issued
V1.0-V1.5	Feb 2009	MC	MC	GC
V1.6	Feb 2025	TB	TC	GC
V1.7	Sep 2025	TB	TC	GC

2. INTRODUCTION

This manual is intended for all users of **Geosense® Strain Gauge Load Cells** manufactured by Geosense and provides information on their installation, operation and maintenance.

It is VITAL that all personnel responsible for the use of SGLC Instruments READ and UNDERSTAND this manual, prior to working with the equipment

2.1. General Description

The primary uses for the **Geosense® SGLC (Strain Gauge Load Cell)** series are measuring loads acting on:

- Ground anchors
- Rock bolts
- Tie backs

Particular features of the **Geosense® SGLC** series are:

- Robust steel construction
- Accommodates eccentric loading
- Reliable long-term performance
- Rugged, suitable for demanding environments
- High accuracy
- Data logger compatible

The **Geosense® SGLC-7000** series load cell consists of a cylinder of high strength steel with a series of electrical resistance strain gauges connected around the periphery as a Wheatstone Bridge that compensates for unevenly distributed loads and provides a single mV/V signal output.

When the load cell is subjected to load the resistance of the strain gauges will change and the output signal is directly proportional to the applied load.

The load cells are compensated for temperature variations often found during normal operating environments.

Connection to the load cell is via a heavy-duty multi-core sheathed cable which can be connected to a direct portable readout, switched terminal units or a data logging system.

Mounting surfaces should be flat and parallel for optimum performance and the use of abutment plates and load distribution plates is recommended.

2.2. Theory of Operation

The **Geosense® SGLC-7000** Series of Strain Gauge Load Cells consists of a solid or anchor cylinder of high strength stainless steel with a series of electrical resistance strain gauges connected around the periphery as a Wheatstone Bridge that compensates for unevenly distributed loads and provides a single mV/V signal output.

It is most commonly used to measure load acting on piles, struts, arch supports and props.

When the load cell is subjected to load the resistance of the strain gauges will change and the output signal is directly proportional to the applied load. Mounting surfaces should be flat and parallel for optimum performance and the use of loading cap for strut monitoring is recommended.

Connection to the load cell is via a heavy-duty multi-core sheathed cable which can be connected to a direct portable readout, data logger or Wi-SOS 480 system.

3. VARIANTS

There are two main design variants of the SGLC system, used for different applications.

3.1. SGLC-7000

The SGLC-7000 variant consists of a through-hole design to allow for tensioning strands / bars for retaining walls etc.

Figure 1: Example of a SGLC-7000

3.2. SGLC-7050

The SGLC-7050 variant is of a solid design and is designed for measuring loads where a tensioned member does not need to pass through the centre.

Figure 2: Example of a SGLC-7050

3.3. Distribution Plate Variants

All **Geosense®** load cells must have a top and bottom distribution plate installed before use.

These plates evenly distribute the load across the cell and reduce the risk of damage to the cells. For VW load cells, the top and bottom plates are normally separate.

SGLC's vary from this approach slightly in that instead of having two removable plates (top and bottom), only the top plate is removable. The bottom plate is part of the load cell itself. This means the user only needs to add the top plate to the cell before use.

This is design difference is detailed in XXX

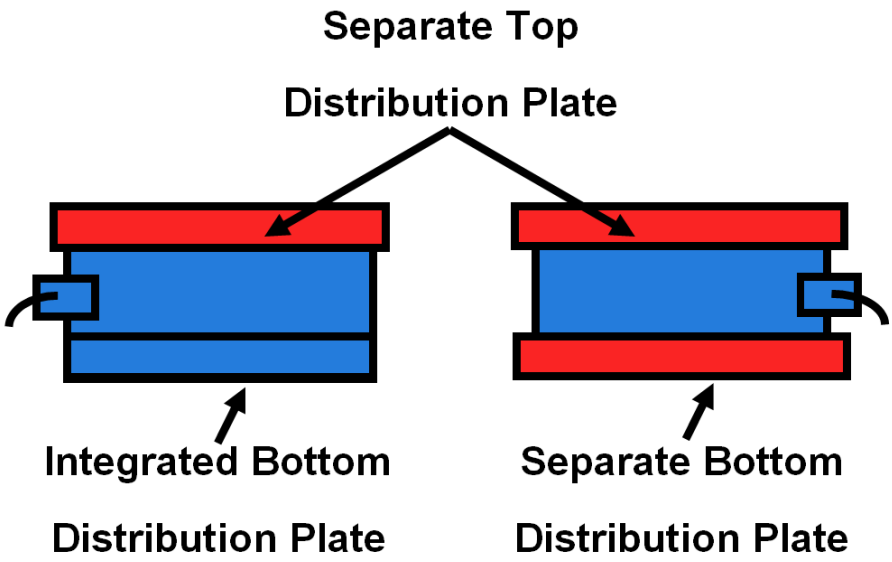


Figure 3: Illustration of variance between integrated bottom distribution plate versus two removable plates

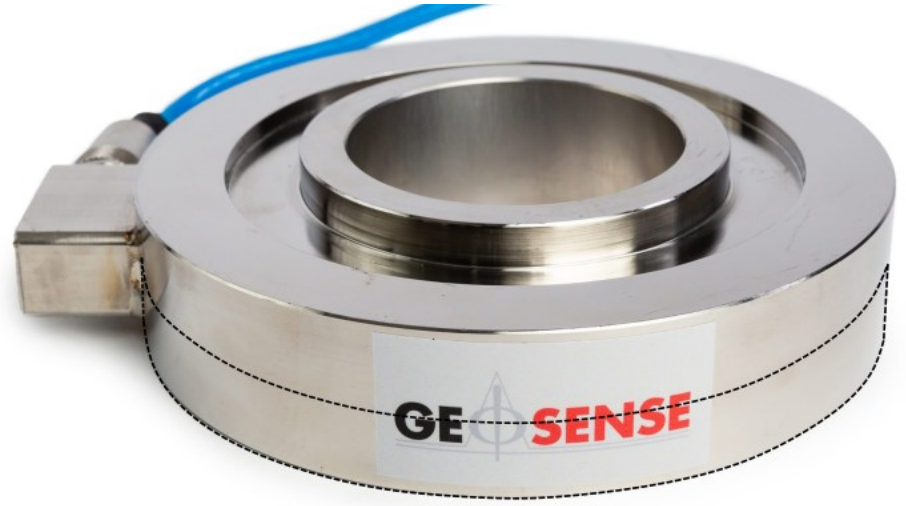


Figure 4: SGLC-7000 marked-up with position of integrated bottom distribution plate

4. WIRING CONFIGURATIONS

SGLC-7000 and **7050** versions come in three wiring variants, depending primarily on load rating and type.

Both versions are supplied with a connector fly lead, allowing the loadcell wiring to be disconnected during install. Length of connector fly leads can be set at time or order.

Typical wiring configurations are provided below, however, every load cell is always supplied with a unique calibration certificate and the cell specific wiring will be stated on this, and takes precedence over the below generalised wiring configurations.

4.1. 4-Wire Version

Colour of Cores	Signal
Yellow	Signal +
Green	Signal -
Red	Supply +
Black	Supply -

4.2. 6-Wire Version – Black Outer Sheath

Colour of Cores	Signal
Yellow	Signal +
Green	Signal -
Red	Supply +
Black	Supply -
White	Reference +
Blue	Reference -

4.3. 6-Wire Version – Blue Outer Sheath

Colour of Cores	Signal
Green	Signal +
Yellow	Signal -
Red	Supply +
Black	Supply -
White/Brown	Reference +
Blue	Reference -

5. CONFORMITY

CE

EU Declaration of Conformity

We

Geosense Ltd
Nova House, Rougham Industrial Estate, Bury St Edmunds, IP30 9ND, United Kingdom

declare under our sole responsibility that the product:

Equipment description: Strain Load cells

Model Numbers(s):
VWLC-7000, VWLC-7050,

to which this declaration relates are in conformity with all the essential requirements of the Restriction on the use of certain Hazardous Substances **2011/65/EU**

The following harmonised standards have been applied with respect to this product:

EN IEC 63000:2018

Authorised Person

Tim Clegg
Director

Date: 30/04/2024
Location: Bury St Edmunds, UK.

DoC-07003-CE

UKCA Declaration of Conformity

Geosense Ltd
Nova House, Rougham Industrial Estate, Bury St Edmunds, IP30 9ND, United Kingdom

This declaration is issued under the sole responsibility of the manufacturer:

Equipment description: Strain Load cells

Model Numbers(s):
VWLC-7000, VWLC-7050,

The object of the declaration described above is in conformity with the following statutory requirements:

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations	SI 2012 No. 3032

The following harmonised standards have been applied with respect to this product:

EN IEC 63000:2018

Signed for and on behalf of Geosense Ltd

Tim Clegg
Director

Date: 30/04/2024
Location: Bury St Edmunds, UK.

DoC-07003-UKCA

6. MARKINGS

Geosense® SGLC series instruments are labelled with the following information:

- Manufacturers name & contact details
- Product type
- Model
- Serial number
- CE mark / UKCA mark

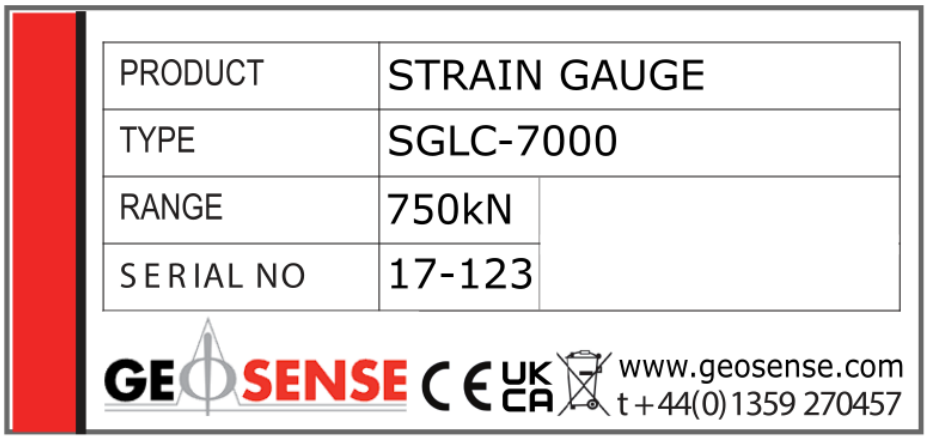


Figure 5: SGLC-7000 with Geosense specification label

7. DELIVERY

This section should be read by all users of equipment manufactured by **Geosense®.**

7.1. Packaging

Geosense® SGLC's are packed for transportation to site. Packaging is suitably robust to allow normal handling by transportation companies. Inappropriate handling techniques may cause damage to the packaging and the enclosed equipment. The packaging should be carefully inspected upon delivery and any damage **MUST** be reported to both the transportation company and **Geosense®**.

Once the shipment has been checked it is recommended that **Geosense® SGLC**'s remain in their original packaging for storage or transportation.

Cable should be handled with care. Do not allow it to be damaged by sharp edges, rocks for example, and do not exert force on the cable as this my damage the internal conductors and render the installation useless.

7.2. Handling

Whilst they are a robust devices, **Geosense® SGLC** series systems are precision measuring instruments. They and their associated equipment should always be handled with care during transportation, storage and installation.

Once the shipment has been inspected (see 7.3), it is recommended that equipment remains in its original packaging for storage or onward transportation.

7.3. Inspection / Functionality Check Readings

It is important to check all the equipment in the shipment as soon as possible after taking delivery and well before installation is to be carried out. Check that all the components detailed on the documents are included in the shipment. Check that the equipment has not been physically damaged.

All **Geosense® SGLC** instruments carry a unique identification serial number which is located on the cable connection block or on the side of the cell (dependent on model).

Geosense® SGLC instruments are supplied with individual calibration sheets that include their serial numbers and these are shipped with the equipment. Calibration sheets should be kept safe and secure for future reference. See section 8.

7.4. Storage

All **Geosense® SGLC** instruments and associated equipment should be stored in an environment that is protected from direct sunlight.

It is also recommended that cables be stored in a dry environment to prevent moisture migrating along inside them in the unlikely event of prolonged submersion of exposed conductors. The cables should also be protected from rodents and traffic.

No other special requirements are needed for medium or long-term storage although temperature limits should be considered when storing or transporting associated components, such as readout equipment.

8. CALIBRATION

All **Geosense® SGLC** instruments are supplied with a calibration sheet like the example below.

GEOSENSE QUALITY FORM
Form No G/QF/153
ISS. 7
DATE : Sept-24
SIG : GC

STRAIN GAUGE LOAD CELL CALIBRATION

Model	SGLC-7500 SERIES	Temp (°C)	20
Serial No	2420777	Excitation Voltage	2-15V
Nominal Range (kN)	1000	Cal Date	13/09/2024

Cable length (m)	12m

Load Applied (kN)	Theoretical Output (mV/V)	Actual Output (mV/V)	Calculated Load (kN)		Error % FSO	
			Linear	Polynomial	Linear	Polynomial
0.00	0.0000	0.0000	0.24	0.10	0.02%	0.01%
100.00	0.2000	0.1994	100.02	99.88	0.00%	-0.01%
200.00	0.4000	0.3992	200.01	199.92	0.00%	-0.01%
300.00	0.6000	0.5990	299.99	299.99	0.00%	0.00%
400.00	0.8000	0.7989	400.03	400.13	0.00%	0.01%
500.00	1.0000	0.9984	499.86	500.05	-0.01%	0.01%
600.00	1.2000	1.1979	599.70	599.94	-0.03%	-0.01%
700.00	1.4000	1.3980	699.83	700.06	-0.02%	0.01%
800.00	1.6000	1.5979	799.87	800.00	-0.01%	0.00%
900.00	1.8000	1.7978	899.91	899.82	-0.01%	-0.02%
1000.00	2.0000	1.9989	1000.54	1000.11	0.05%	0.01%

Factors:

Linear K	500.427405			
Polynomial	A	B	C	D
	-0.513356919	1.065622883	500.2004663	0.100775758

Polynomial calculation [kN] = A * (Reading)^3 + B * (Reading)^2 + C*(Reading) + D
Linear calculation = k (kN) * (Current Reading - Site Zero Reading)

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

Wiring Configuration mV/V:	
Colour	Signal
Yellow	+ Signal
Green	- Signal
Red	+ Supply
Black	- Supply
White	+ Reference
Blue	- Reference

4 Wire / 6 Wire

Load cell specific wiring (if applicable)

THIS IS AN ELECTRONIC CERTIFICATE AND IS VALID WITHOUT A SIGNATURE

9. INSTALLATION

This section of the manual is intended for all users of **Geosense® SGLC** instruments and is intended to provide guidance with respect to their installation.

It is VITAL that all personnel responsible for the use of SGLC Instruments READ and UNDERSTAND this manual, prior to working with the equipment

It is VITAL to check all the equipment in the shipment soon after taking delivery and well before installation is to be carried out. Check that all components that are detailed on the shipping documents are included.

9.1. General Best Practice

- Note serial number against location
- Mark cables for future identification. Use an appropriate coding system and mark cables at frequent intervals, not just at the ends.
- Protect the ends of the signal cable. Cables should be terminated at a waterproof box or with waterproof connectors.

9.2. Load Distribution Plates

To obtain stable measurements and minimise errors due to eccentricity, the **Geosense® SGLC** instruments should be installed using a pair of load distribution plates which are supplied by Geosense. An abutment plate should be made locally to suit the local site requirement.

It is VITAL that load cells are not subjected to point loads or eccentric loads
(i.e. loads that compress part of the cell more than another part)

9.2.1. Recommended loading procedure

It is critical that any load is transferred to a load cell effectively. This means that loads are not concentrated onto points, and are not eccentric (i.e. one side of the cell compressed more than another)

Each installation will differ; however, it is important to consider the following points:

- All loads should be transmitted to the full diameter of the load cell
- All loads should be central and perpendicular to the load cell to avoid eccentric loads as best as possible
- Abutment/bearing plates should be the exact same size or a larger diameter than the load cell with a completely flat face
- Distribution plates should always be used between abutment/bearing plates

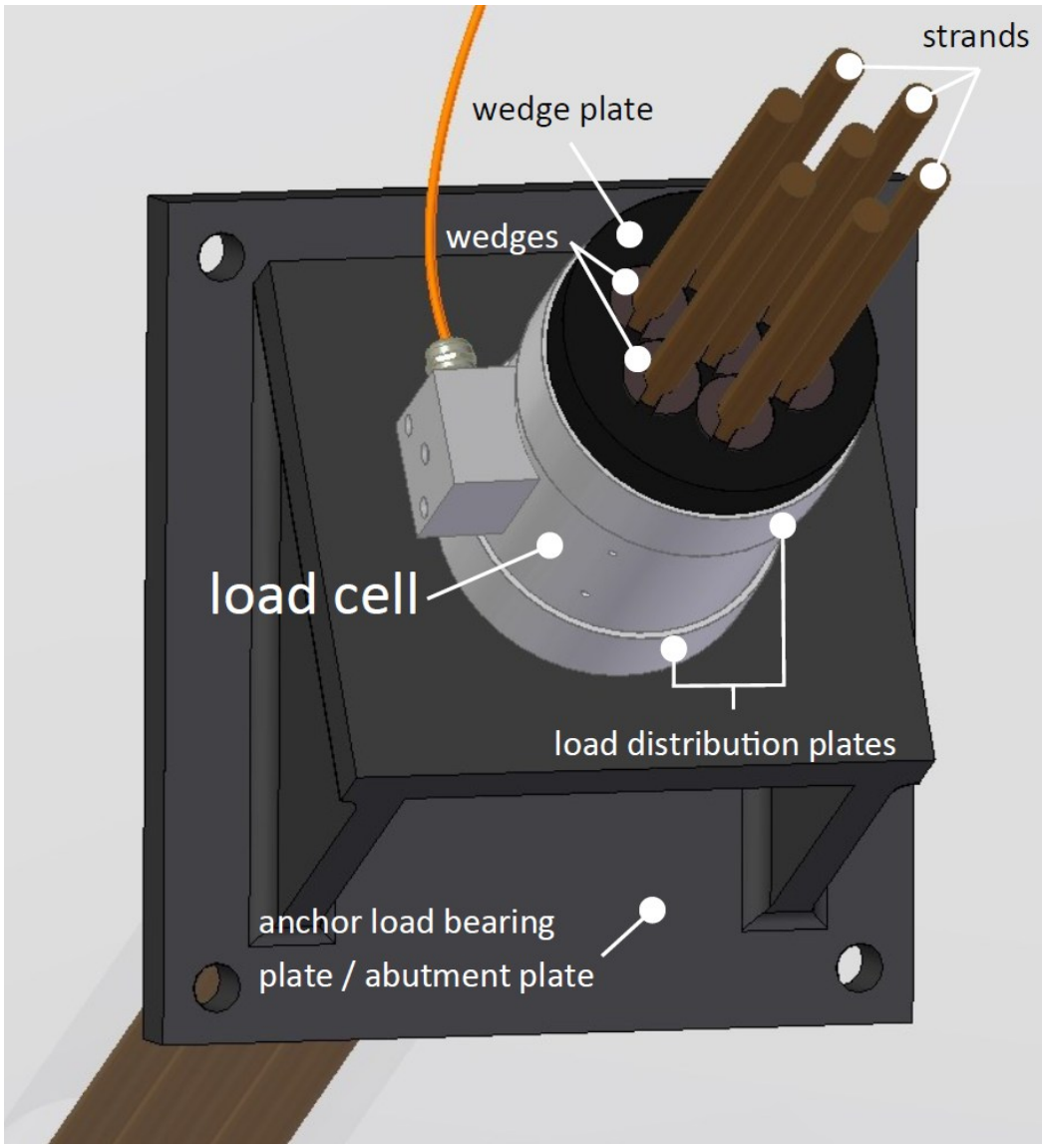


Figure 6: Proper loading setup of load cell to avoid point and eccentric loads

9.3. Anchor Load Cell (multi-strand and solid bar)

Installation of **Geosense® Strain Gauge Load Cell (SGLC-7000)** should be carried out as follows:

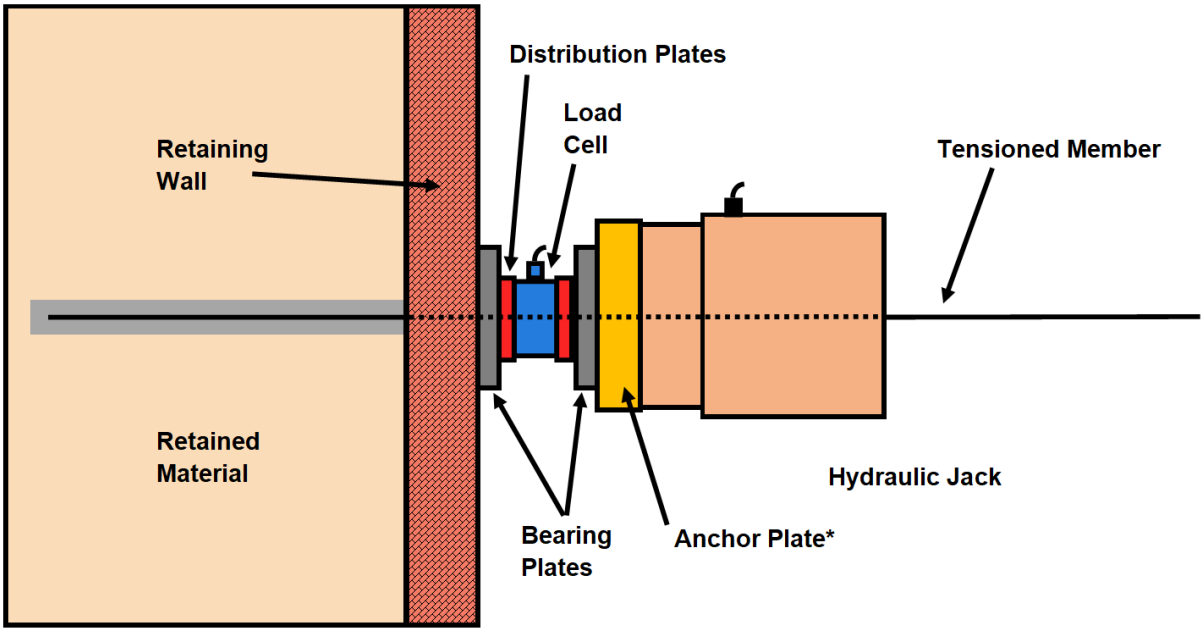


Figure 7: Anchor load cell installed between retaining wall and a tensioning jack

*Anchor plate design and nomenclature may vary depending on type of member being tensioned – image for reference only.

1) Ensure that the internal diameter of the cell is correct for the anchor strands or bolt head.

2) Ensure that the capacity of the cell is sufficient for the anchor including the testing.

3) If necessary, fabricate an abutment or bearing plate/pad (Figure 8).

Figure 8: Bearing plate fabricated and placed between wall and loadcell distribution plate

4) Place the base load distribution plate over the anchor strands or bolt followed by the cell and then the top load distribution plate.

5) Place the anchor stands through the wedge plate or nut. Connect the signal cable to the load cell and then to either a portable readout or a data logger. Record the output when it is ZERO load.

Figure 9: Jack placed above load cell

9.4. Solid Load Cell

Installation of **Geosense® Strain Gauge Load Cell (SGLC-7050)** should be carried out as follows:

9.4.1. Strut Installation

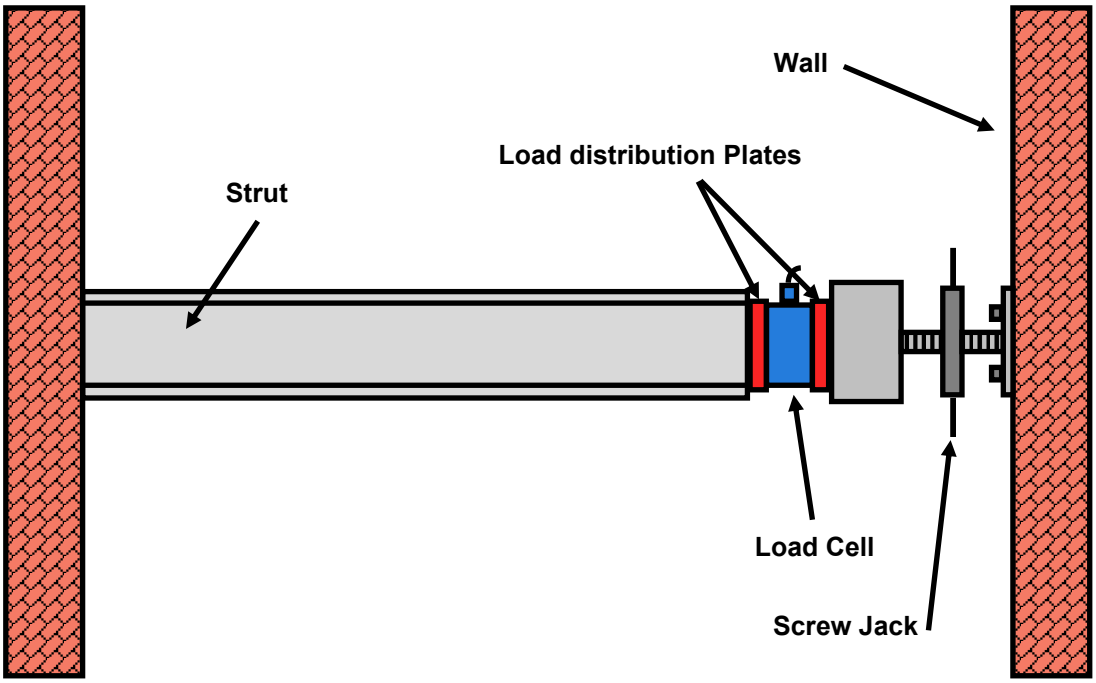


Figure 10: Solid load cell installed on a strut

1) It is recommended that load distribution plates are installed between the structural members/bearing plates and the load cell. The bearing plates (where applicable) will need to be carefully positioned and where necessary fixed in place or supported. Suitable lifting equipment may be necessary in some installations to support the weight of the load cell and to ensure correct alignment.

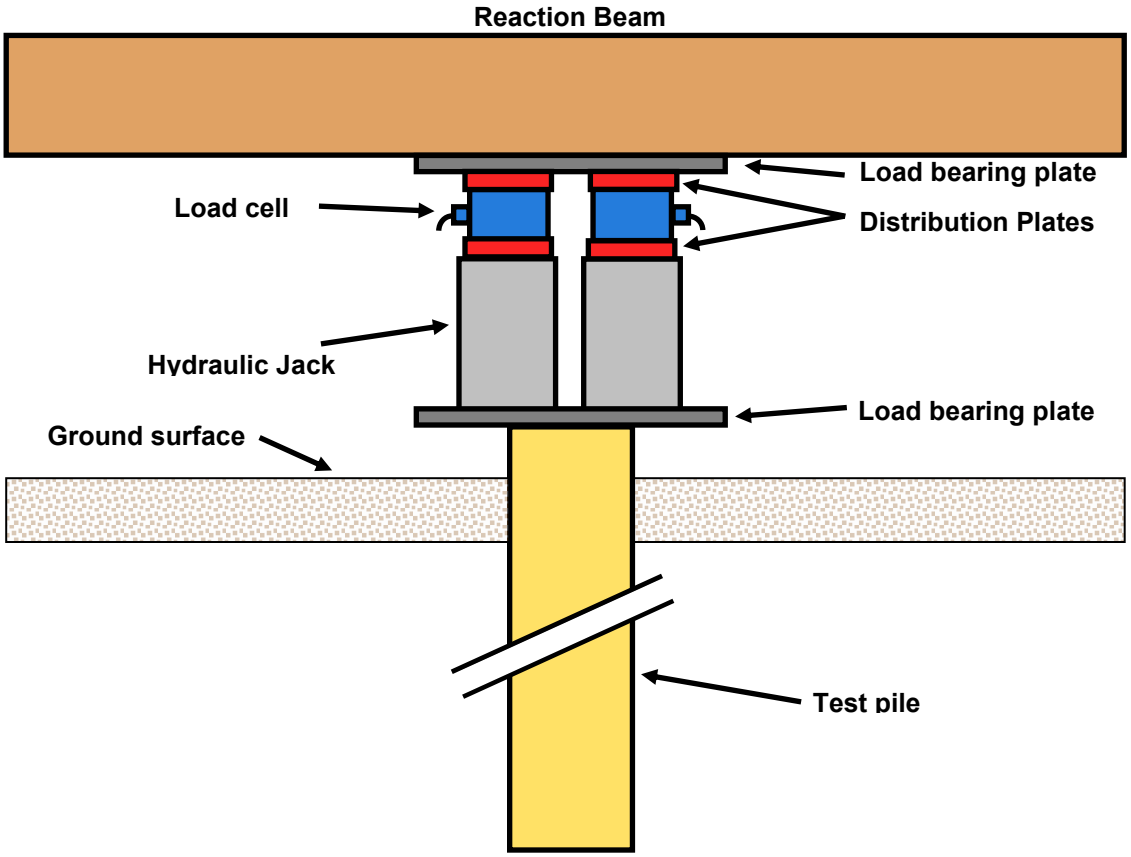
2) With the load cell in the correct position slowly move the strut towards the load cell (usually using a screw jack) until there is interaction.

3) When the strut is in interaction with the load cell, connect a readout as outline in section 10.1.

4) Continue to load the cell until the desired load is reached. (Please note that this should be done in multiple smaller increments, as if compressed too quickly the cell may become deformed.

5) Once the readings are stable, and at the required load, take initial readings.

9.4.2. Pile Test Installation



1) It is recommended that load distribution plates are installed between the structural members/bearing plates/reaction beam and the load cell. The bearing plates (where applicable) will need to be carefully positioned and where necessary fixed in place or supported. Suitable lifting equipment may be necessary in some installations to support the weight of the load cell and to ensure correct alignment.

2) With the load cell in the correct position slowly move the bearing plates towards the load cell (usually using a hydraulic jack) until there is interaction.

3) When the strut is in interaction with the load cell, connect a readout as outline in section 10.1.

4) Continue to load the cell until the desired load is reached. (Please note that this should be done in multiple smaller increments, as if compressed too quickly the cell may become deformed.

5) Once the readings are stable, and at the required load, take initial readings.

10. DATA HANDLING

The function of an instrument is to provide useful and reliable data. Accurate recording and handling of the data is essential if it is to be of any value.

10.1. Taking Readings

Geosense® offer a range of readout and data logging options. Specific operation manuals are supplied with each readout device.

For use with the **Geosense® MP12 Portable Readout** (refer to MP12 manual) connect signal cable from the Load Cell to the readout following the wiring colour code provided in section 0.

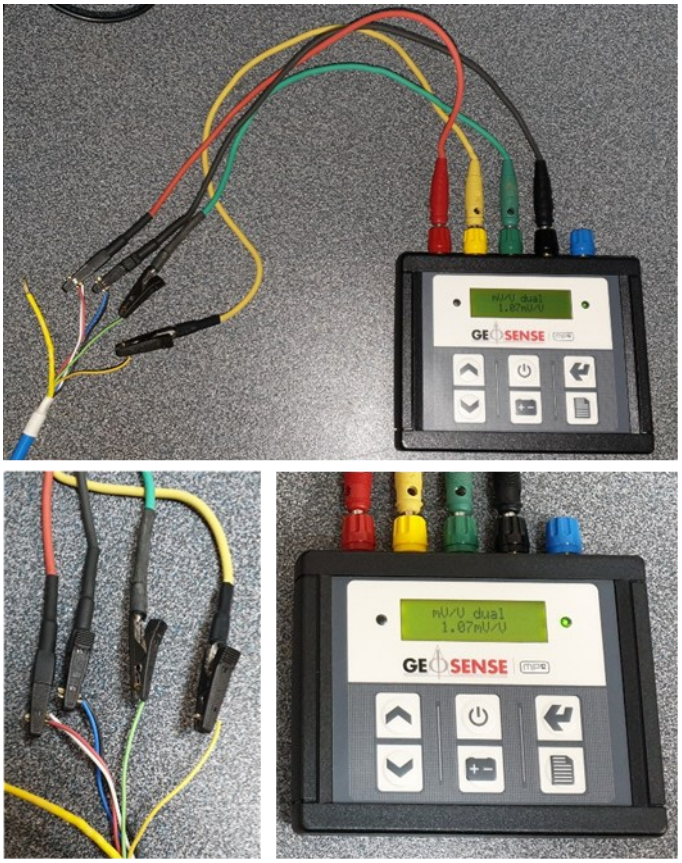


Figure 11: Geosense MP12 used to read a mV/V sensor

The **MP12** allows the ratio-metric reading of the loadcell with output of mV/V (millivolts per volt).

The typical output of **Geosense® SGLC's** is 2.0mV/V, however the datasheet and calibration certificates should always be consulted to confirm this for each instrument as it may differ.

10.2. Data Reduction

10.2.1. Polynomial Calculation

Each **Geosense® SGLC** is calibrated by loading in incremental steps and recording the data.

The readings are averaged, and a regression is done with Applied Load versus the averaged readings to get the load cell constants. The constants are used in the polynomial formula below for calculating the current load.

$$kN = A \times (R)^3 + B \times (R)^2 + C \times (R) + D$$

Where:

A = Constant from calibration sheet
B = Constant from calibration sheet
C = Constant from calibration sheet
D = Constant from calibration sheet
R = Current average reading in mV/V
kN = Reading of force in kilonewtons

10.2.2. Polynomial Example

Using the values shown in the calibration sheet (section 8)

Factors:

Linear K	500.427405			
Polynomial	**A**	**B**	**c**	**D**
	-0.513356919	**1.065622883**	**500.2004663**	**0.100775758**

Taking an example current reading from the calibration certificate (rather than a real reading) of 300kN, this equates to an output of 0.5990mV/V

Therefore:

$$kN = A \times (R)^3 + B \times (R)^2 + C \times (R) + D$$

Where:

A = -0.513356919
B = 1.065622883
C = 500.2004663
D = 0.100775758
R = 0.5990
kN = Reading of force in kilonewtons

$$kN = -0.513356919 \times (0.5990)^3 + 1.065622883 \times (0.5990)^2 + 500.2004663 \times (0.5990) + 0.100775758$$

$$kN = 299.99287$$

10.2.3. Linear Calculation

A linear calculation can also be used to calculate the change in load from site zero using the current averaged readings, however this comes with a slight drop in accuracy which is stated on the calibration sheet, though for most applications this accuracy is still sufficient.

$$kN = k \times (R_c - R_z)$$

Where:

k = Constant from calibration sheet
Rc = Current reading in mV/V
Rz = Site zero reading in mV/V
kN = Reading of force in kilonewtons

10.2.4. Linear Example

Using the values shown in the calibration sheet (section 8)

Factors:

Linear K	**500.427405**			
Polynomial	A	B	c	D
	-0.513356919	1.065622883	500.2004663	0.100775758

Taking an example current reading from the calibration certificate (rather than a real reading) of 300kN, this equates to an output of 0.5990mV/V

Therefore:

$$kN = k \times (R_c - R_z)$$

Where:

k = 500.427405
Rc = 0.5990
Rz = 0.0000 (from calibration sheet as example of zero reading)
kN = Reading of force in kilonewtons

$$kN = 500.427405 \times (0.5990 - 0)$$

$$kN = 299.7560156$$

10.3. Temperature Considerations

Geosense® Strain Gauge Load Cells are often installed in environments that are subjected to significant variations in temperature and these changes will affect their readings.

Thermal influences are complex because it is not only the load cell that is affected but the element to which it is attached and whole structure that is affected. The rate of temperature change and the distribution of the thermal gradients also play a major part in influencing the actual load at any point and its effect on the load cell and its readings.

Consequently, in order to apply any correction for temperature it is necessary to first establish the effects of the temperature changes on the load cell and the medium in/on which it is installed.

A useful exercise to carry out on site to establish the in-situ effects of temperature changes is to observe the installed load cell readings, together with both ambient and cell temperatures, when no other factors are changing. This should be carried out prior to any loading or other structural changes / works are carried out.

An alternative is to use a ‘no load” load cell installed close to the monitoring cells. This will enable an assessment of temperature effects on the cell itself in the working environment for a particular location. For further discussion about ‘no load”, load cells please contact **Geosense®**.

It is important to remember that thermal effects on load cells will not be the same for any two installations, and engineering judgement will need to be used.

11. MAINTENANCE

Geosense® Strain Gauge Load Cells are basically maintenance free device for most applications, but the following should be considered during the service life:

- Keep away from direct sunlight to avoid large thermal affects
- Keep the cable connection cap on when Readout not connected
- Avoid any impacts or significant vibration which can damage internal sensors
- Keep cables away from physical damage
- Keep cable ends waterproof

12. TROUBLESHOOTING

12.1. Unexpected Readings

The following are common scenarios which lead to the readings and performance of load cells being questioned.

The reading taken on the Jack is taken at a different time from that taken on the load cell

The strand is tensioned using the jack, the locking collets are then replaced, and the anchor left to take the load. It is at this point the load on the installed permanent cell is read and does not equate the load in the Jack prior to release. This is because of the Young's modulus of the anchor and all the slight play in the fixtures and fittings of the system that cause elasticity in the system, it is the release of the stored energy in the system whilst transferring load to the anchor and so at the same time through the load cell that cause this indifference. It is not the fault of the load cell installed but merely a part of the stressing process that is overlooked due to a lack of knowledge that trusting the instruments will help provide. It is recommended to carry out Lift Off Testing for cell reading versus jack reading to identify any loss of load transfer.

The use of a jack which is much longer than the squat load cells

This is more prone to inaccurate measurement of the loading due to eccentric loading causing the system more likely to contain bending moment in the system and so likely to cause friction between the ram and the seal, otherwise known as binding of the seal of the Jack. This will cause the loading to be over registered by the Jack. Unfortunately, this is often understood as under registering load by the load cell. It is worth noting that each cell has been individually calibrated before despatch and not touched since while the ram has probably been used on site to install hundreds of anchors since its last calibration date and so its calibration data must also be viewed as less valid.

12.2. Unstable Readings

Readings can become unstable due to external influences or problems with the Readout. If unstable readings are experienced check the following:

- Electrical interference can be emitted from heavy or generating equipment and can affect the readings.

Table 1: Troubleshooting symptoms, causes and remedy

Symptom	Possible cause	Possible remedy
Unstable readings	Electrical interference from Heavy or generating equipment Loose connections	Remove equipment Ground all cables Check connections
	Low Readout battery	Charge or replace battery
No signal	Cable damage	Check resistance of each cable core

For troubleshooting purposes, the expected resistance values across the cores are provided in the below table, these should be checked if there is cause for concern. The tolerance for resistance values is dependent on cable length and is expected to be within +/- 100 Ω.

Table 2: Expected resistance values

Colour of signal cable	Electric Solid Load cells	Electric Solid Load cells	Electric Solid Load cells	Electric Solid Load cells	Electric Solid Load cells
	1750kN	Over 2000kN	Under 2500kN	Over 4000kN	Over 5250kN
	Bridge Resistance 700Ω	Bridge Resistance 700Ω	Bridge Resistance 1400Ω	Bridge Resistance 1400Ω	Bridge Resistance 1400Ω
Red + Black	700 Ω	700 Ω	1400 Ω	1400 Ω	1400 Ω
Green + White	700 Ω	700 Ω	1400 Ω	1400 Ω	1400 Ω
Red + Green	520 Ω	520 Ω	1050 Ω	1050 Ω	1050 Ω
Red + Yellow	520 Ω	520 Ω	1050 Ω	1050 Ω	1050 Ω
Black + Green	520 Ω	520 Ω	1050 Ω	1050 Ω	1050 Ω
Black + Yellow	520 Ω	520 Ω	1050 Ω	1050 Ω	1050 Ω

13. SPARE PARTS

Geosense® SGLC-7000 / 7050 load cells do not have any replaceable parts.

Civil engineering sites are hazardous environments and instrument cables can be easily damaged, if they are not adequately protected. **Geosense®** can therefore provide the following parts that may be required to effect repairs to instrument cables:

- PU coated 4 Core cable with foil shield and copper drain.
- PVC coated, armoured, 4 Core cable suitable for direct burial.
- Epoxy jointing kit for forming a waterproof cable joint.

Please contact **Geosense®** for price and availability of the above components.

14. RETURN OF GOODS

14.1. Returns Procedure

If goods are to be returned for either service/repair or warranty, please fill in the information via the website https://www.geosense.co.uk/returns/ where a **Returns Authorisation Number** together with **a Returns Form** will be automatically generated and sent to you via email.

The **Returns Form** should be sent together with the returned goods.

14.1.1. Chargeable Service or Repairs

Inspection & Estimate
It is the policy of **Geosense®** that an estimate is provided to the customer prior to any repair being carried out. A set fee for inspecting the equipment and providing an estimate is also chargeable.

A valid purchase order (credit customer) or advance payment for the inspection fee(s) is required before inspection can take place. In the event of a warrantable claim being accepted, the value will be credited back to the customer's account (credit customer) or refunded (pre-payment customer).

14.1.1. Warranty Claim

(See Limited Warranty Conditions)
This covers defects which arise as a result of a failure in design or manufacturing. It is a condition of the warranty that the **VW Strain Gauge** must be handled and used in accordance with the manufacturer's instructions and has not been subjected to misuse.

In order to make a warranty claim tick the warranty claim box under **REASON FOR RETURN** on the website and return the goods as above. You will then be contacted and informed whether your warranty claim is valid.

14.2. Packaging and Carriage

All used goods shipped to the factory **must** be sealed inside a clean plastic bag and packed in a suitable carton. If the original packaging is not available, **Geosense®** should be contacted for advice. **Geosense®** will not be responsible for damage resulting from inadequate returns packaging or contamination, under any circumstances.

14.3. Transport & Storage

All goods should be adequately packaged to prevent damage in transit or intermediate storage.

15. LIMITED WARRANTY

The manufacturer, (**Geosense Ltd)**, warrants the **SGLC** manufactured by it, under normal use and service, to be free from defects in material and workmanship under the following terms and conditions:

Sufficient site data has been provided to **Geosense®** by the purchaser as regards the nature of the installation to allow **Geosense®** to select the correct type and range of **SGLC** and other component parts.

The **SGLC** equipment shall be installed in accordance with the manufacturer's recommendations.

The equipment is warranted for **2 years** from the date of shipment from the manufacturer to the purchaser.

The warranty is limited to replacement of part or parts which are determined to be defective upon inspection at the factory. Shipment of defective part or parts to the factory shall be at the expense of the Purchaser. Return shipment of repaired/replaced part or parts covered by this warranty shall be at the expense of the Manufacturer.

Unauthorised alteration and/or repair by anyone which, causes failure of the unit or associated components, will void this **LIMITED WARRANTY** in its entirety.

The Purchaser warrants through the purchase of the **SGLC** equipment that he is familiar with the equipment and its proper use. In no event shall the manufacturer be liable for any injury, loss or damage, direct or consequential, special, incidental, indirect or punitive, arising out of the use of or inability to use the equipment sold to the Purchaser by the Manufacturer.

The Purchaser assumes all risks and liability whatsoever in connection with the **SGLC** equipment from the time of delivery to Purchaser

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