Model 8940

GeoNet Localized Data Loggers

Instruction Manual



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TABLE OF CONTENTS

1. INTRODUCTION 1

1.1 8940 MODEL LIST 1

1.2 8943 MODEL LIST 1

1.3 INCLUDED ACCESSORIES 2

1.4 ADDITIONAL ACCESSORIES (NOT INCLUDED) 2

2. MODELS 3

2.1 VIBRATING WIRE (VW) DATA LOGGERS 3

2.1.1 SINGLE-CHANNEL VIBRATING WIRE DATA LOGGER 3

2.1.2 FOUR-CHANNEL VIBRATING WIRE DATA LOGGER 3

2.1.3 EIGHT-CHANNEL VIBRATING WIRE DATA LOGGER 4

2.2 ADDRESSABLE (RS-485) DATA LOGGER 4

2.3 TILT DATA LOGGER 5

2.1 WATERPROOF DATA LOGGERS 6

2.1.1 SINGLE-CHANNEL WATERPROOF DATA LOGGER 6

2.1.2 FOUR-CHANNEL WATERPROOF DATA LOGGER 6

3. INSTALLATION 7

3.1 INSTALLATION OVERVIEW 7

3.2 MOUNT THE DATA LOGGER 7

3.3 CONNECT AN EARTH GROUND 7

3.4 REMOVE THE COVER 7

3.5 CONNECT THE SENSORS 8

3.5.1 CABLE GLAND CONNECTIONS 8

3.5.2 10-PIN CONNECTIONS 9

3.5.3 WATERPROOF 6-PIN CONNECTIONS 9

3.6 EXPANDING DATA LOGGER CAPACITY (OPTIONAL) 10

3.7 POWER THE DATA LOGGER 10

3.8 SET UP DATA LOGGER TO RECORD AND DOWNLOAD DATA 10

3.9 SEAL THE DATA LOGGER 11

4. MAINTENANCE 12

4.1 WEATHER PROOFING 12

APPENDIX A. TROUBLESHOOTING 13

APPENDIX B. SPECIFICATIONS 14

B.1 VIBRATING WIRE DATA LOGGER SPECIFICATIONS (STANDARD AND WATERPROOF) 14

B.2 ADDRESSABLE (RS-485) DATA LOGGER SPECIFICATIONS 14
B.3 TILT DATA LOGGER SPECIFICATIONS 15
APPENDIX C. CONNECTOR PINOUTS 16
C.1 VW DATA LOGGERS WITH CABLE GLAND CONNECTION 16
C.2 VW DATA LOGGERS WITH 10-PIN BULKHEAD CONNECTION 16
C.3 ADDRESSABLE (RS-485) DATA LOGGERS 16
C.4 VW DATA LOGGERS WITH 6-PIN CONNECTION 17
APPENDIX D. UNIT DIMENSIONS 18
D.1 SINGLE-CHANNEL (01C) AND ADDRESSABLE (ADR) MODELS (NOT WATERPROOF) 18
D.2 FOUR-CHANNEL (04C) MODELS (NOT WATERPROOF) 18
D.3 EIGHT-CHANNEL (08C) MODELS 19
D.4 TILT (TLT) MODELS 19
D.5 WATERPROOF MODELS 20
APPENDIX E. MOUNTING BRACKET DIMENSIONS 21
E.1 SINGLE-CHANNEL (01C) AND ADDRESSABLE (ADR) MODELS (NOT WATERPROOF) 21
E.2 FOUR-CHANNEL 04C MODELS (NOT WATERPROOF) 22
E.3 EIGHT-CHANNEL (08C) MODELS 23
E.4 TILT (TLT) MODELS 23
APPENDIX F. COMPONENTS (TYPICAL REPLACEMENT PARTS) 24
F.1 SINGLE-CHANNEL (01C) AND ADDRESSABLE (ADR) MODELS (NOT WATERPROOF) 24
F.2 FOUR-CHANNEL (04C) MODELS (NOT WATERPROOF) 25
F.3 EIGHT-CHANNEL (08C) MODELS 26
F.4 TILT (TLT) MODELS 27
F.5 WATERPROOF MODELS 28
APPENDIX G. VIBRATING WIRE LOAD CELL WIRING 29
G.1 WIRING SINGLE LOAD CELL 29
G.2 LOAD CELL CONFIGURATION SWITCH SETTINGS 29

1. INTRODUCTION

GEOKON Model 8940 Series Localized Data Loggers offer a high-value data collection option for all GEOKON Vibrating Wire (VW) instruments and digital sensor (MEMS and VW) strings. Data Loggers are now manufactured with a pressure compensation vent to prevent condensation buildup in humid climates.

Waterproof single and four-channel GeoNet Data Loggers housed inside rugged PVC enclosures are also available.

Each data logger is ready to be installed from the factory and acquires data in minutes. Sensor data is collected on site by connecting the 8940 to a P.C. and using the free GEOKON Agent software program for data viewing and reporting.

Model 8960 Digital Vibrating Wire interfaces can be connected to GeoNet multi-channel and addressable data loggers to expand the capacity of the data logger (See Section 3.6).

Data logger setup and data downloads must be done using Agent Software. The GEOKON Agent program can be downloaded at geokon.com/Software.

FEATURES:

- USB connection for firmware updates, diagnostics, and more.

1.1 8940 MODEL LIST

Model Number	Data Logger Type	Sensor Cable Entry
8940-01C-CBL	Single-Channel Vibrating Wire	Cable Gland
8940-01C-10P	Single-Channel Vibrating Wire	10-Pin Connector
8940-04C-CBL	Four-Channel Vibrating Wire	Cable Gland
8940-04C-10P	Four-Channel Vibrating Wire	10-Pin Connector
8940-08C-CBL	Eight-Channel Vibrating Wire	Cable Gland
8940-ADR-CBL	Addressable	Cable Gland
8940-TLT-NAP	Tilt	Not Applicable

TABLE 1: *List of Model 8940 Data Loggers*

1.2 8943 MODEL LIST

Model Number	Description	Sensor Cable Entry
8943-01C-WP	Single-Channel Waterproof Data Logger	6-Pin Connector
8943-04C-WP	Four-Channel Waterproof Data Logger	6-Pin Connector
8943-CAB-100	Waterproof Cable with female 6-pin connector and collar, 30 m length	Not Applicable
8943-CAB-200	Waterproof Cable with female 6-pin connector and collar, 60 m length	Not Applicable
8943-CAB-VL	Waterproof Cable with female 6-pin connector and collar, specify length (>60 m)	Not Applicable
02-250P4	Green Polyurethane Cable,6.35 mm (±0.25 mm) [0.25"] Ø, 2 twisted pairs, for the above	Not Applicable

TABLE 2: *List of Model 8943 Data Loggers and Cables*

1.3 INCLUDED ACCESSORIES

GeoNet Product Line	Part Number	Description	Quantity
Model 8940 Data Loggers	S-BAT-111	Includes two Alkaline D-Cell Batteries	1
Model 8943 Waterproof Data Loggers	S-BAT-111	Includes two Alkaline D-Cell Batteries	1
	SUP-514	Desiccant pack, 10 grams	4

TABLE 3: *List of Included Accessories by GeoNet Product Line*

1.4 ADDITIONAL ACCESSORIES (NOT INCLUDED)

Accessory Application	Part Number	Description
12 Volt Battery Conversion	8020-7-1	Solar Panel, 20-watt, regulated. For use with a 12V battery (customer supplied). Includes side-of-pole mounts, charge controller, and 4.5 m (15') interconnect cable with battery clips.
	8800-7 or -7V	External 12V battery conversion cable, 3 m (10') length. Used with Local (SUP) gateways and Data Loggers. Varied cable lengths are available (-7V model). **Note: Requires machining or available cable gland fitting.**
Other	BAT-202	Includes **one** Lithium D-Cell battery, 1 Ah (Two batteries are required for operation)
	KIT-GEONET-C, including: COM-169 TLS-111 TLS-112	**Accessory Kit for Standard (8940) Models, including:** USB 2.0 A Male to C Male Cable #3 Phillips Head Screwdriver 3/32" Flat Head Screwdriver
	KIT-GEONET-WP-C, including: COM-169 TLS-639	**Accessory Kit for Waterproof (8943) Models, including:** USB 2.0 A Male to C Male Cable 5/16" Combination Wrench
	KIT-GEONET (For Legacy Products), including: COM-166 TLS-111 TLS-112	**Accessory Kit for Standard (8940) Legacy Products, including:** Mini USB to STD A Cable #3 Phillips Head Screwdriver 3/32" Flat Head Screwdriver
	KIT-GEONET-WP (For Legacy Products), including: COM-166 TLS-639	**Accessory Kit for Waterproof (8943) Legacy Products, including:** Mini USB to STD A Cable 5/16" Combination Wrench
	8943-CAB	Waterproof cable with collar to be attached to a compatible sensor, with a female 6-position fitting on the readout end for connection to a waterproof data logger.

TABLE 4: *Additional Accessories (Not Included)*

2. MODELS

2.1 VIBRATING WIRE (VW) DATA LOGGERS

Model 8940 VW Data Logger series read the quantity of gauges outlined below. Sensor cables are connected through a cable gland or a 10-pin bulkhead connector, depending on model.

2.1.1 SINGLE-CHANNEL VIBRATING WIRE DATA LOGGER

Single-channel data loggers will read one GEOKON vibrating wire gauge and integral thermistor.



FIGURE 1: *Single-Channel 8940 Data Logger*

2.1.2 FOUR-CHANNEL VIBRATING WIRE DATA LOGGER

Four-channel data loggers will read up to four GEOKON vibrating wire gauges and integral thermistors.



FIGURE 2: *Four-Channel 8940 Data Logger*

A four-channel data logger can be configured as follows:

Maximum Number of Gauges	Maximum Number of Load Cells
Four	One 3-gauge **or** one 4-gauge load cell *Refer to Appendix G for load cell wiring tables*

TABLE 5: *Four-Channel Data Logger Gauge/Load Limits*

2.1.3 EIGHT-CHANNEL VIBRATING WIRE DATA LOGGER

Eight-channel data loggers will read up to eight GEOKON vibrating wire gauges and integral thermistors.



FIGURE 3: *Eight-Channel 8940 Data Logger*

An eight-channel data logger can be configured as follows:

Maximum Number of Gauges	Maximum Number of Load Cells
Eight	One 3-gauge **and** one 4-gauge load cell Two 3-gauge **or** two 4-gauge load cells One 6-gauge load cell *Refer to Appendix G for load cell wiring tables*

TABLE 6: *Eight-Channel Data Logger Gauge/Load Limits*

2.2 ADDRESSABLE (RS-485) DATA LOGGER

Model 8940 Addressable Data Loggers are compatible with GEOKON Digital Addressable MEMS products and are capable of reading up to 90 GEOKON MEMS sensors. Where battery life is a concern, GEOKON recommends this data logger be used with strings of 50 sensors or less. Sensor cables are connected through a cable gland.



FIGURE 4: *Addressable 8940 Data Logger*

2.3 TILT DATA LOGGER

Model 8940 Tilt Data Loggers contain an integrated tiltmeter sensor. The two axes of the tiltmeter have a range of ±90° (the calibrated range is ±30°), based on a starting position of 0° (antenna pointing up).

Note: Tilt data loggers do not possess sensor-reading functionality; external sensors cannot be connected.



FIGURE 5: *Tilt 8940 Data Logger*

Tilt data loggers have two serial numbers, the data logger serial number is the upper number, and serial number for the internal tiltmeter is the lower number. See the figure below.

Note: Tilt data logger serial numbers greater than 2047508 provide calibrated output and do not require post processing.

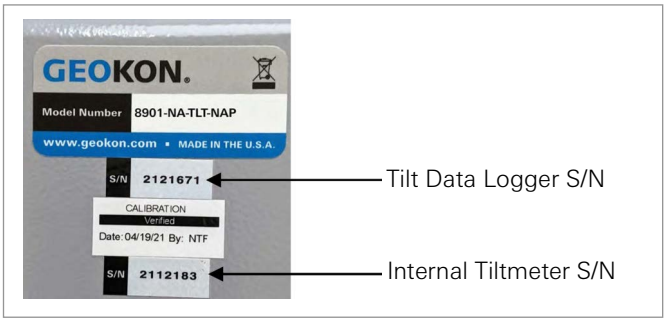


FIGURE 6: *Tilt Data Logger Serial Number Placement*

2.1 WATERPROOF DATA LOGGERS

Model 8943 Waterproof Data Logger Series read the quantity of gauges outlined below. The data loggers are housed inside a rugged PVC enclosure. Sensor cables are connected through a 6-pin connector.

2.1.1 SINGLE-CHANNEL WATERPROOF DATA LOGGER

Single-channel waterproof data loggers will read one GEOKON vibrating wire gauge and integral thermistor.



FIGURE 7: *Single-Channel 8943 Waterproof Data Logger*

2.1.2 FOUR-CHANNEL WATERPROOF DATA LOGGER

Four-channel waterproof data loggers will read up to four GEOKON vibrating wire gauges and integral thermistors.



FIGURE 8: *Four-Channel 8943 Waterproof Data Logger*

A four-channel data logger can be configured as follows:

Maximum Number of Gauges	Maximum Number of Load Cells
Four	One 3-gauge **or** one 4-gauge load cell *Refer to Appendix G for load cell wiring tables*

TABLE 7: *Four-Channel Data Logger Gauge/Load Limits*

3. INSTALLATION

3.1 INSTALLATION OVERVIEW

A general overview of the installation is shown in the steps below. Each step is described in detail in the sections that follow.

1. Mount the data logger
2. Connect an earth ground
3. Remove the cover
4. Connect the sensors
5. Expanding data logger capacity (Optional)
6. Power the data logger
7. Set up data logger to record and download data
8. Seal the data logger

3.2 MOUNT THE DATA LOGGER

- **8940 Models**

  GeoNet mounting brackets are designed to be used with U-bolts, hose clamps, screws, etc. Mount all devices vertically, with the cable entries pointing down. GEOKON recommends a mounting height of at least two meters. Lower than two meters may compromise performance. As a rule, higher is usually better.

- **8943 Models**

  For submersed installations, install the supplied eye bolt in the bottom of the data logger and attach it to a suitable anchor.

3.3 CONNECT AN EARTH GROUND

Properly grounding GeoNet devices will lessen the chance of them being damaged from nearby lightning strikes or other large transient voltages. Each vibrating wire (VW) channel is protected by a 230V gas discharge tube, followed by a high-speed surge protector and a transient voltage suppression diode. Each thermistor (TH) channel is protected by a 230V gas discharge tube, followed by an inductor (lower resistance than high-speed surge protectors) and a transient voltage suppression diode.

For these components to safely divert lightning energy to ground, a solid electrical connection to earth ground is required. All GeoNet devices can be grounded by connecting a suitable earth ground to the mounting bracket. Some GeoNet devices can also be grounded via the copper ground lug on the bottom of the enclosure.

A copper grounding rod at least six feet in length should be driven into the soil to a minimum depth of three feet, as close to the device as possible. Alternatively, any other suitable earth ground attachment may be used. Connect the grounding rod to the mounting bracket or the copper grounding lug on the exterior of the device with a 12 AWG or larger wire. This will provide a path from the device to earth ground in the event of a lightning strike.

3.4 REMOVE THE COVER

Remove the cover by unscrewing the four cap screws on the front of the enclosure.

For the 8943 waterproof models, this step should be done **after sensor connection**.

Important! Ensure that no dirt, water, or other contaminants enter the enclosure.

3.5 CONNECT THE SENSORS

Note: Multi-channel and addressable data loggers will stop trying to read an empty channel after two attempts. The data logger will read all channels at the top of every hour and will resume sampling when it detects a sensor.

3.5.1 CABLE GLAND CONNECTIONS

For ease of wiring, sensor cables should be inserted into the cable glands on multi-channel data loggers in order from left to right and wired into the VW terminal blocks in sequence, starting with channel one.

To connect a sensor using a cable gland connection:

1. Loosen the nut on the cable fitting and remove the white plastic dowel.
2. Slide the sensor cable through the cable gland nut and fitting.
3. Connect the cable leads to the terminal block by holding down an orange tab, inserting the lead, and then releasing the tab. The wiring order is shown in the tables and figures below.

Important! To prevent a short circuit, do not allow the cable leads to touch each other during or after wiring.

4. Pull gently on each conductor to ensure it is secure.
5. Tighten the cable gland nut until it firmly grips the outer jacket of the cable. The cable gland nut must be properly tightened to prevent water entry. Do not overtighten, as this might strip the plastic threads.
6. Pull gently on the gauge cable to ensure it is held in place by the cable gland.
7. Repeat these steps for each gauge cable to be connected.

Single/Multiple.Channel Vibrating Wire Data Logger		
Position	**Color**	**Description**
VW+	RED	Vibrating Wire+
VW-	BLACK	Vibrating Wire-
TH+	WHITE	Thermistor+
TH-	GREEN	Thermistor-
SHD	BARE	Analog Ground (Shield)

TABLE 8: *Vibrating Wire Data Logger Wiring*

Addressable (RS-485) Data Logger		
Position	**Color**	**Description**
485+	WHITE	RS-485 Data+
485-	GREEN	RS-485 Data-
12V	RED	12 Volt Bus
GND	BLACK	Bus Ground
SHD	BARE	Analog Ground (Shield)

TABLE 9: *Addressable (RS-485) Data Logger Wiring*

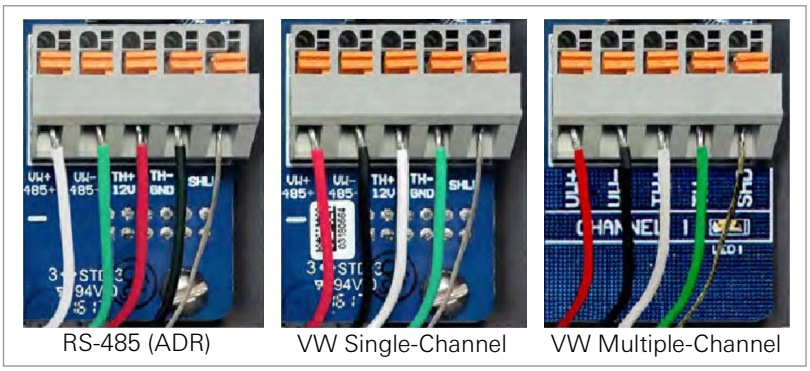


FIGURE 9: *Terminal Connections*

3.5.2 10-PIN CONNECTIONS

To connect a device using a 10-pin connection:

1. Remove the cover from the 10-pin connector.
2. Align the grooves on the sensor connector (male), with the connector on the data logger (female).
3. Push the connector into place and then twist the outer ring of the male connector until it locks.

3.5.3 WATERPROOF 6-PIN CONNECTIONS

To connect a sensor to Model 8943 Waterproof Data Loggers:

1. Loosen the locking sleeve by rotating it counterclockwise. Then remove the "dummy" connector from the data logger by pulling on it. (You will experience some resistance when removing the connector due to the internal O-ring seal.)
2. Align the large pin on the data logger connector (male) with the large hole on the sensor connector (female). (Use the 3H logo on the female connector as a guide as shown in the figure below.)
3. Push the connectors together until they are completely mated.
4. Tighten the locking sleeve onto the connector by turning it clockwise.
5. Repeat the above process for the rest of the sensors.
6. When connections are complete, remove the cover by unscrewing the four cap screws on the connector side of the enclosure.

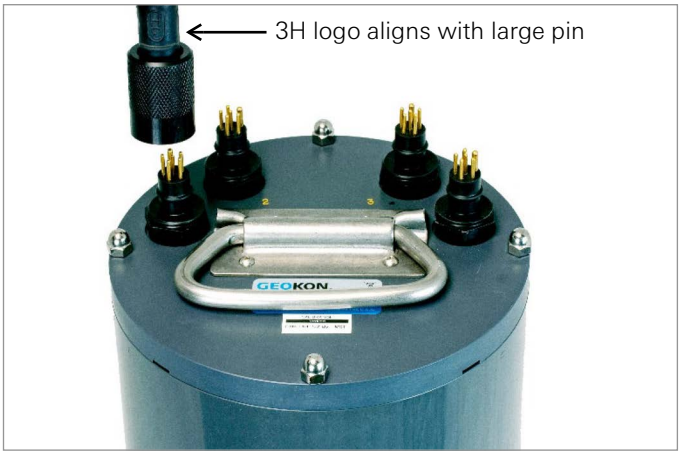


FIGURE 10: *Connector Alignment*

3.6 EXPANDING DATA LOGGER CAPACITY (OPTIONAL)

Model 8960 Digital Vibrating Wire interfaces can be connected to GeoNet multi-channel and addressable data loggers to expand the capacity of the data logger. Multiple VW interfaces can be daisy-chained together to bus the data to a single data logger. The bus limit is 32 units or 64 Channels.

Refer to the Model 8960 Instruction Manual (geokon.com/8960-Series) for information on how to connect a data logger to an interface, how to address the interfaces, and other applicable steps. To get immediate software recognition the interfaces must be connected before the data logger has been powered on.

3.7 POWER THE DATA LOGGER

1. Align the positive (+) side of the batteries with the + indicator in the battery holder. Push the batteries straight down into the holder.
2. Move the battery select switch to either the ALKALINE or LITHIUM position depending on the type of battery being used (Figure 11).

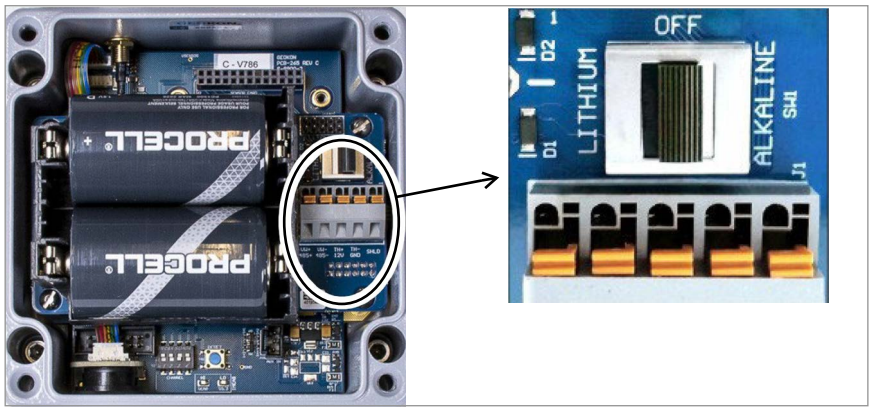


FIGURE 11: Battery Switch Location and Detail

3.8 SET UP DATA LOGGER TO RECORD AND DOWNLOAD DATA

Note: The same Agent transfer file must be used for any GeoNet 8940 data logger when connecting, downloading, or making changes to the sensor settings and log intervals.

See the GeoNet Agent Software Instruction Manual (geokon.com/8800-GNA) for detailed instructions.

1. Connect to the 8940 data logger to a PC via the USB port. (For Model 8943 Waterproof Data Loggers, the USB port is located inside the data logger.)
2. Verify the COM port configuration with the **Windows Device Manager**.
3. Open **Agent software**
4. **Add new network**, verify name, Address (or COM), Read interval.
5. Select **Save**.

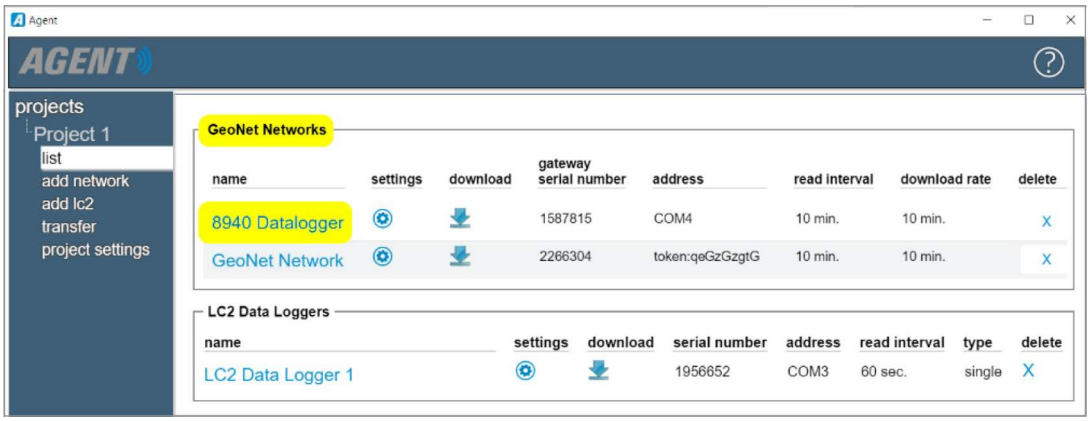


FIGURE 12: *The Data Logger will appear in the GeoNet Networks category*

6. Configure sensors in the Logger Settings tab.
7. Configure charts as desired.
   - **Data must be downloaded** from the data logger before any chart data is visible. Data download can be performed manually from the list view, or automatically in the network settings view.
   - Data can be exported after download.
   - When the data logger has been configured, create an **Agent Transfer File** to share with all users who will be connecting to and downloading from this data logger.
   - Any user can load the saved transfer file onto their PC using Agent Software. GEOKON highly recommends this because all sensor settings are software configurations only and do not reside on the data logger. This means any user that connects to the data logger without a preconfigured transfer file will have no settings loaded. Any data downloaded will not be viewable by that user until the sensors are configured for export.

Note: All subsequent visits to the data logger to download data must use the **Master** transfer file to connect and download data so that data logger and sensor settings remain unchanged.

3.9 SEAL THE DATA LOGGER

1. Record the serial number of the data loggers and the attached sensors. For multi-channel data loggers, also record the channel to which each sensor has been connected.
2. **Model 8943 Waterproof Data Logger Only:** Insert the desiccants into the enclosure.
3. Make sure the cover gasket and the mating ridge on the enclosure are clean and that the gasket is properly seated inside the groove.
4. Place the cover on the unit, making sure the orientation is correct.
5. Tighten the cover screws a little at a time, working in a diagonal pattern.
6. Check that the cover has closed tightly and evenly.

Note: Make sure any unused openings are plugged with the provided dowel and the cable gland nut is tightened.

4. MAINTENANCE

4.1 WEATHER PROOFING

With the exception of Model 8943 Waterproof Data Logger, standard GeoNet devices are designed to be splash proof and rain proof but **are not submersible**. The enclosures are sealed by a gasket. The gasket will only prevent water entry if the screws that hold the lid in place are properly tightened, and the gasket is properly aligned inside the lid.

Always mount the devices so that the cable entries are on the bottom. Ensure the cable gland fittings are securely tightened and that the white plastic dowels provided are used to plug cable entries which are not in use. For models that feature a 10-pin connector, the watertight cap must be installed when the connector is not in use.

For Model 8943 Waterproof Data Loggers, it is important to periodically check the desiccant packs inside the devices and change them out as necessary with fresh ones.

Despite these precautions, the data loggers may encounter leakage along the cable if the cable is cut, or if the unit is installed in an especially humid environment.

APPENDIX A. TROUBLESHOOTING

Listed below are a few commonly experienced problems and remedial action. Visit geokon.com/Technical-Support for additional troubleshooting help.

SYMPTOM: UNIT WILL NOT RESPOND TO COMMUNICATIONS

- ☐ Wrong connection type, or incorrect address specified in Agent software.
- ☐ The batteries may be improperly installed. Check their placement.
- ☐ The batteries inside the unit may be dead. Replace the batteries.

SYMPTOM: DATA PRESENT (E.G., BATTERY/SIGNAL STRENGTH) BUT NO VW GAUGE DATA AVAILABLE

- ☐ Verify that the gauge leads are wired correctly inside the data logger. (See Section 3.5.1).
- ☐ Check the gauge for proper operation with an independent readout, such as a GK-404 or GK-406.

SYMPTOM: VW GAUGE READING IS UNSTABLE

- ☐ Move any sources of electrical noise away from the transducer cable, such as generators, motors, arc welding equipment, high voltage lines, etc.

SYMPTOM: THERMISTOR DISPLAY SHOWS -273.15 DEGREES C

- ☐ This indicates an open circuit to thermistor leads. Verify that the thermistor leads are properly connected inside the data logger. (See Section 3.5.1).
- ☐ Check the thermistor for proper operation with an independent readout, such as a GK-404 or GK-406.

APPENDIX B. SPECIFICATIONS

B.1 VIBRATING WIRE DATA LOGGER SPECIFICATIONS (STANDARD AND WATERPROOF)

Data Memory	32 MB
Storage Capacity	Varies by model
Trueness	0.082 Hz
Frequency Precision	±0.146 Hz (99% CI)
Frequency Resolution	±0.002 Hz
Thermistor Accuracy	1% (0.5° C thermistor point match)
Thermistor Resolution	0.032 °C
Scan Interval	Min: 1 minute; Max: 1 day
Power Supply	2x D cell, Alkaline or Lithium, 12 V Auxiliary
Operating Temperature	-40 °C to +65 °C (range varies by power source)
VW Frequency Range	400-6,500 Hz
Enclosure Material	Standard: Die-cast aluminum Waterproof: PVC
Enclosure Dimensions	See Appendix D

TABLE 10: *Vibrating Wire Data Logger Specifications*

B.2 ADDRESSABLE (RS-485) DATA LOGGER SPECIFICATIONS

Data Memory	32 MB
Storage Capacity	Varies by sensor sting connected
MEMS Sensor Limit	32 Sensors
Communication Protocol	RS-485 Modbus
Thermistor Accuracy	1% (0.5° C thermistor point match)
Thermistor Resolution	0.032 °C
Scan Interval	Min: 1 minute; Max: 1 day
Power Supply	2x D cell, Alkaline or Lithium, 12 V Auxiliary
Operating Temperature	-40 °C to +65 °C (range varies by power source)
Enclosure	Die-cast aluminum 120 × 122 × 91 mm

TABLE 11: *Addressable (RS-485) Data Logger Specifications*

B.3 TILT DATA LOGGER SPECIFICATIONS

Range[1]	±90°
Resolution[2]	0.00025° (0.004 mm/m)
Precision[3]	±0.0075° (±0.13 mm/m)
Nonlinearity	±0.005° across ±30° range (±0.09 mm/m)
Temperature Dependent Uncertainty	±0.001° across ±5° angular range (±0.016 mm/m) ±0.0016° across ±15° angular range (±0.026 mm/m) ±0.0026° across ±30° angular range (±0.042 mm/m)
Axis	2
Data Memory	32 MB
Storage Capacity	500,000 readings
Thermistor Accuracy	1% (0.5 °C thermistor point match)
Thermistor Resolution	0.032 °C
Scan Interval	Min: 1 minute; Max: 1 day
Power Supply	2x D cell, Alkaline or Lithium, 12 V Auxiliary
Operating Temperature	-40 °C to +65 °C (range varies by power source)
Enclosure[4]	Die-cast aluminum 120 × 122 × 91 mm

TABLE 12: *Tilt Data Logger Specifications*

Note:

[1] Calibrated Range: ±30°

[2] 99% confidence interval (i.e., 99 out of 100 individual readings fall within this tolerance).

[3] Includes random walk (changes between consecutive readings that have no discernible cause) and seismic noise during testing.

[4]Eye bolt and cable sleeve add approximately 82 mm

APPENDIX C. CONNECTOR PINOUTS

C.1 VW DATA LOGGERS WITH CABLE GLAND CONNECTION

Terminal Strip Position	Description	Cable Wire Color
VW+	Vibrating Wire+	RED
VW-	Vibrating Wire-	BLACK
TH+	Thermistor+	WHITE
TH-	Thermistor-	GREEN
S	Analog Ground (Shield)	BARE WIRE

TABLE 13: *VW Data Logger, Cable Gland Connection*

C.2 VW DATA LOGGERS WITH 10-PIN BULKHEAD CONNECTION

10-Pin Bulkhead	Internal Wire Color	Description	Cable Wire Color
A	Brown	Vibrating Wire+	RED
B	Red	Vibrating Wire-	BLACK
C	Orange	Thermistor+	WHITE
D	Yellow	Thermistor-	GREEN
E	Green	Analog Ground (Shield)	BARE WIRE
F	Blue	+VCC Supply	N/A
G	Violet	Digital Ground	N/A
H	Grey	Mux Reset	N/A
J	White	Mux Clock	N/A
K	Black	Digital Ground	N/A

TABLE 14: *VW Data Logger, 10-Pin Bulkhead Connection*

C.3 ADDRESSABLE (RS-485) DATA LOGGERS

Terminal Strip Position	Description	Cable Wire Color
485+	RS-485 Data+	WHITE
485-	RS-485 Data-	GREEN
12V	12 Volt Bus	RED
GND	Bus Ground	BLACK
S	Analog Ground (Shield)	BARE WIRE

TABLE 15: *Addressable Data Logger, Cable Gland Connections*

C.4 VW DATA LOGGERS WITH 6-PIN CONNECTION

6-Pin Connector	Internal Wire Color	Description	Cable Wire Color
1	Red	Vibrating Wire+	RED
2	Black	Vibrating Wire-	BLACK
3	White	Thermistor+	WHITE
4	Green	Thermistor-	GREEN
5	Grey	Analog Ground (Shield)	BARE WIRE
6	N/C	N/A	N/C

TABLE 16: *VW Data Logger, 6-Pin Connection*

APPENDIX D. UNIT DIMENSIONS

Note: Dimensions shown below are in inches.

D.1 SINGLE-CHANNEL (01C) AND ADDRESSABLE (ADR) MODELS (NOT WATERPROOF)

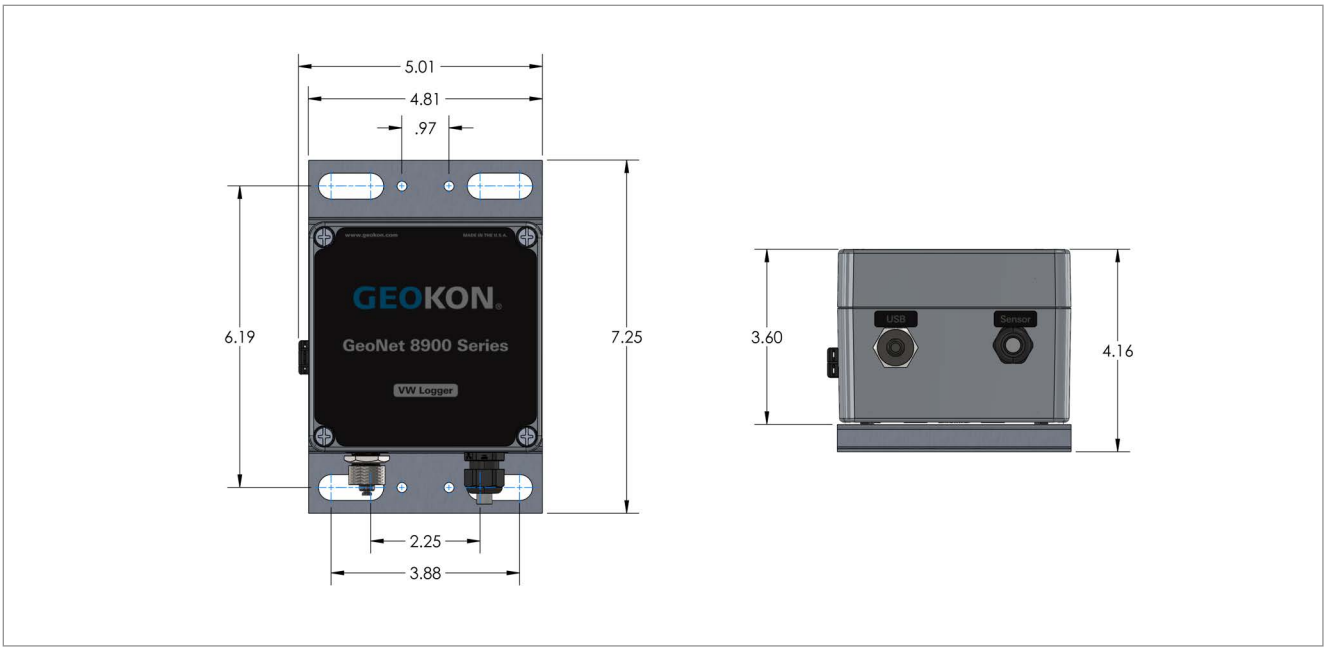


FIGURE 13: *Single-Channel (01C) and Addressable (ADR) Models*

D.2 FOUR-CHANNEL (04C) MODELS (NOT WATERPROOF)



FIGURE 14: *Four-Channel (04C) Models*

D.3 EIGHT-CHANNEL (08C) MODELS

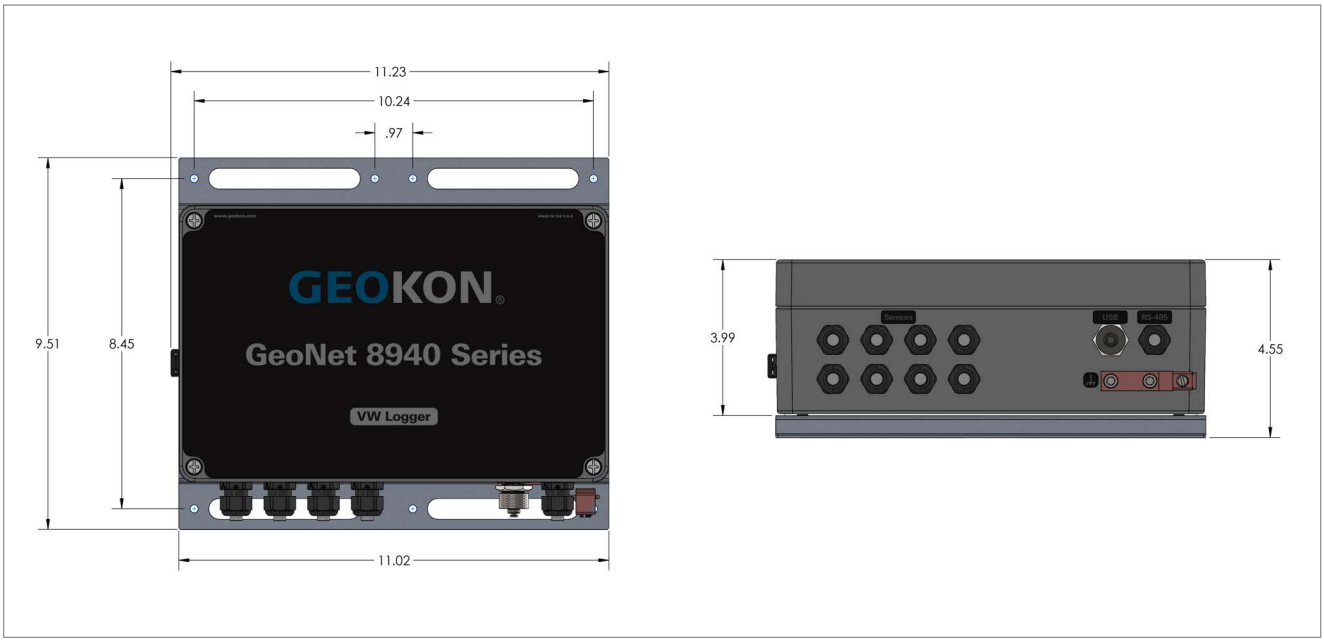


FIGURE 15: *Eight-Channel (08C) Models*

D.4 TILT (TLT) MODELS

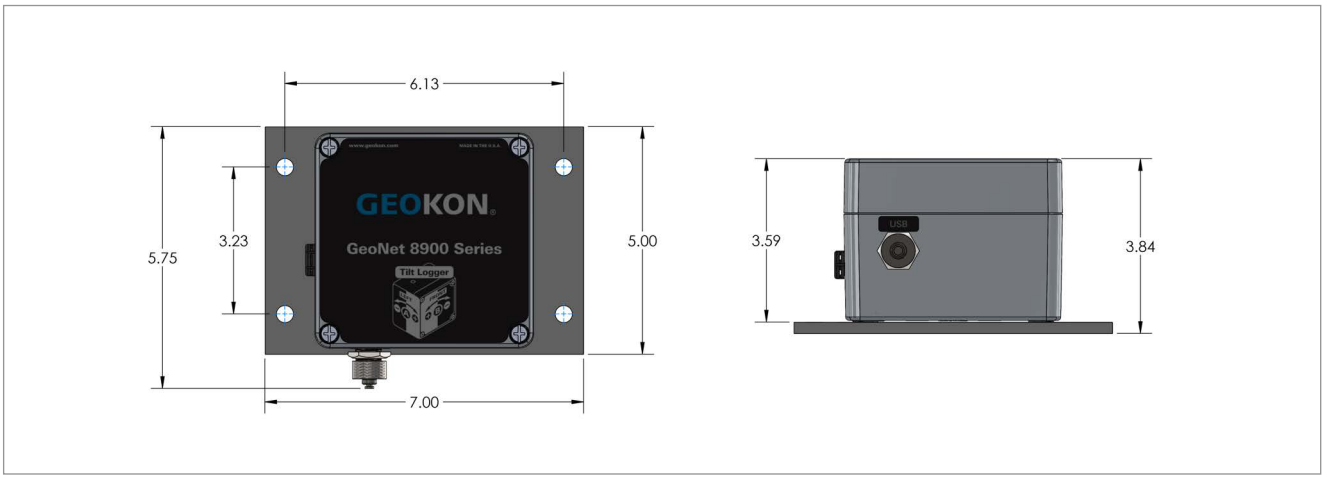


FIGURE 16: *Tilt (TLT) Models*

D.5 WATERPROOF MODELS

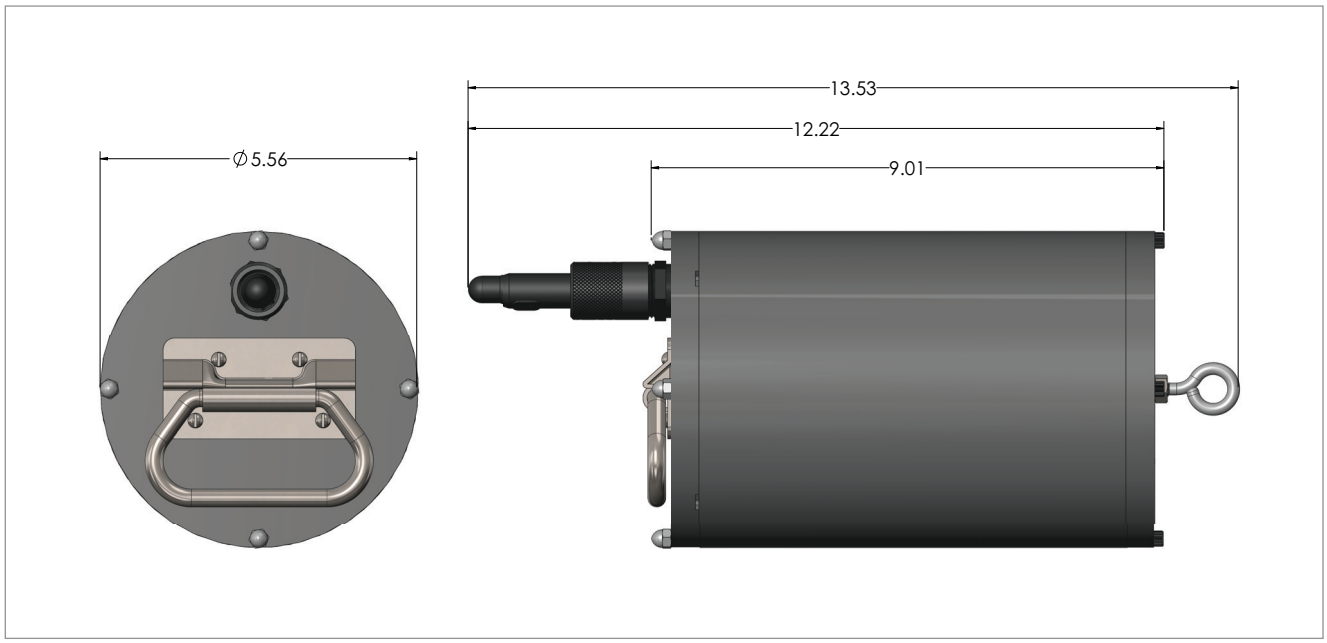


FIGURE 17: *Single-Channel Waterproof (01C-WP) Model*

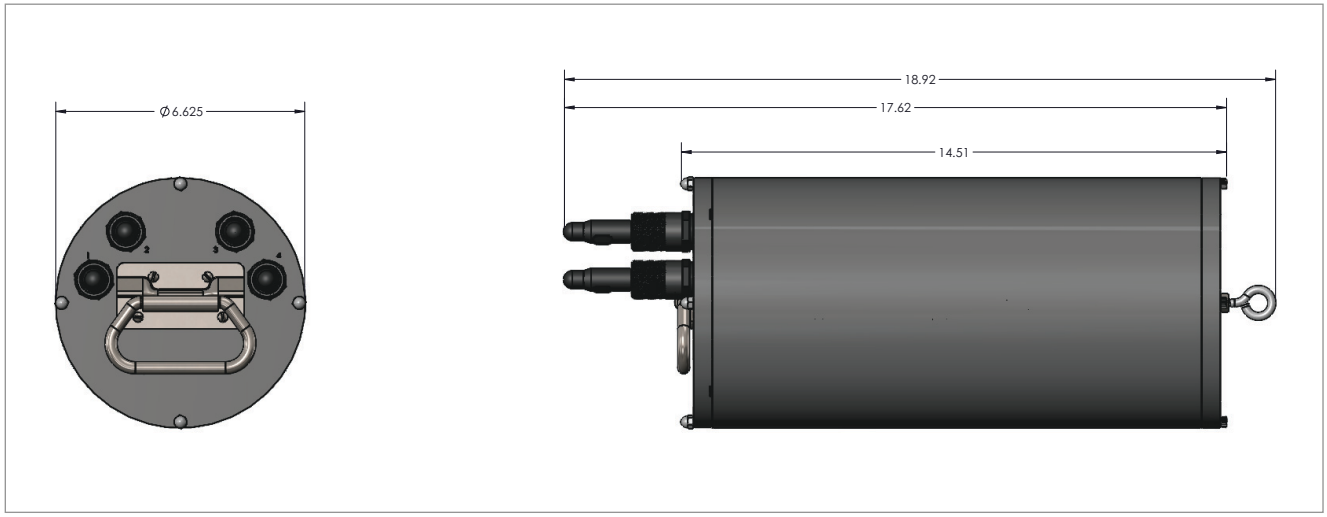


FIGURE 18: *Four-Channel Waterproof (04C-WP) Model*

APPENDIX E. MOUNTING BRACKET DIMENSIONS

Note: Dimensions shown below are in inches.

E.1 SINGLE-CHANNEL (01C) AND ADDRESSABLE (ADR) MODELS (NOT WATERPROOF)

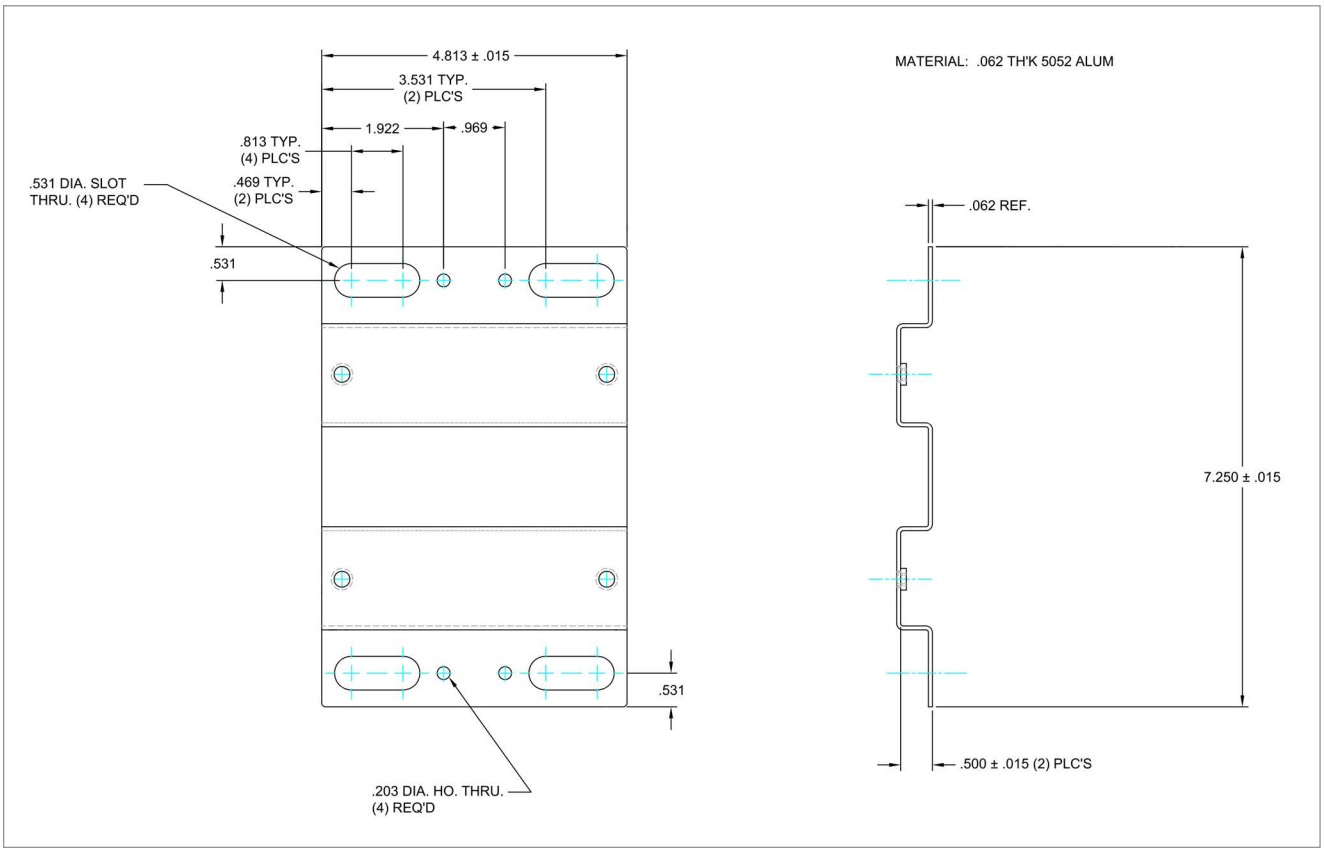


FIGURE 19: *Single-Channel (01C) and Addressable (ADR) Models*

E.2 FOUR-CHANNEL 04C MODELS (NOT WATERPROOF)

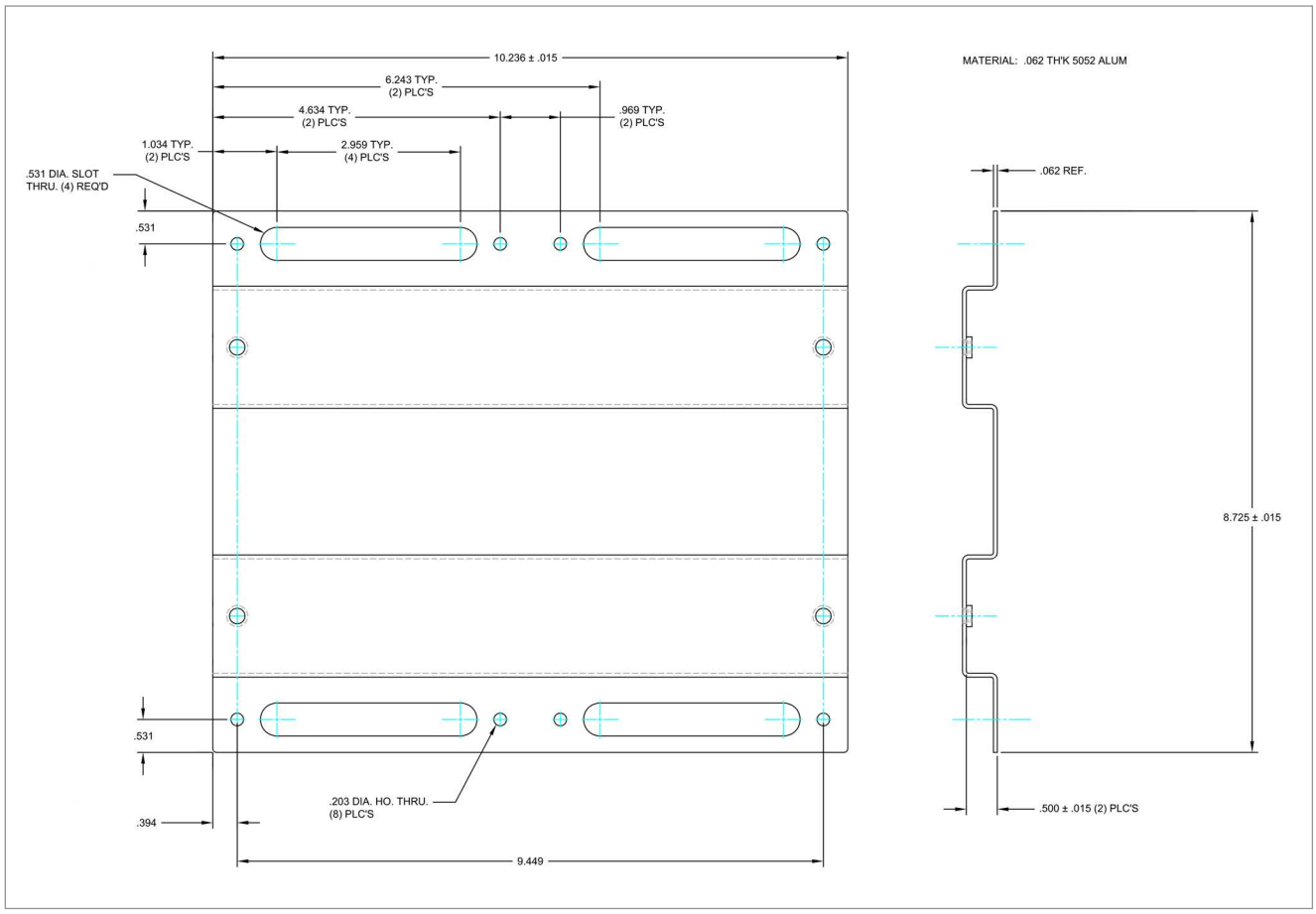


FIGURE 20: *Four-Channel (04C) Models*

E.3 EIGHT-CHANNEL (08C) MODELS

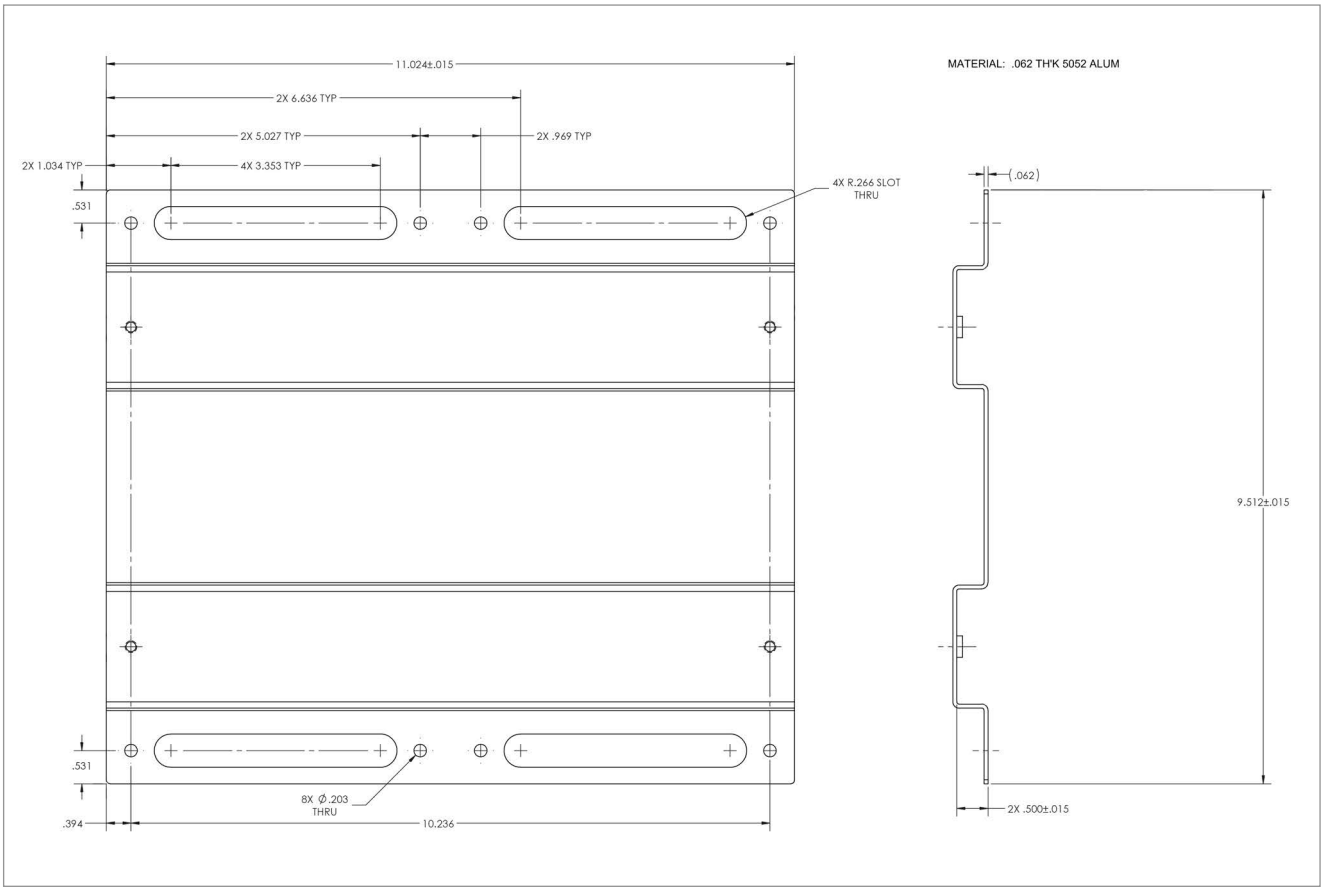


FIGURE 21: *Eight-Channel (08C) Models*

E.4 TILT (TLT) MODELS

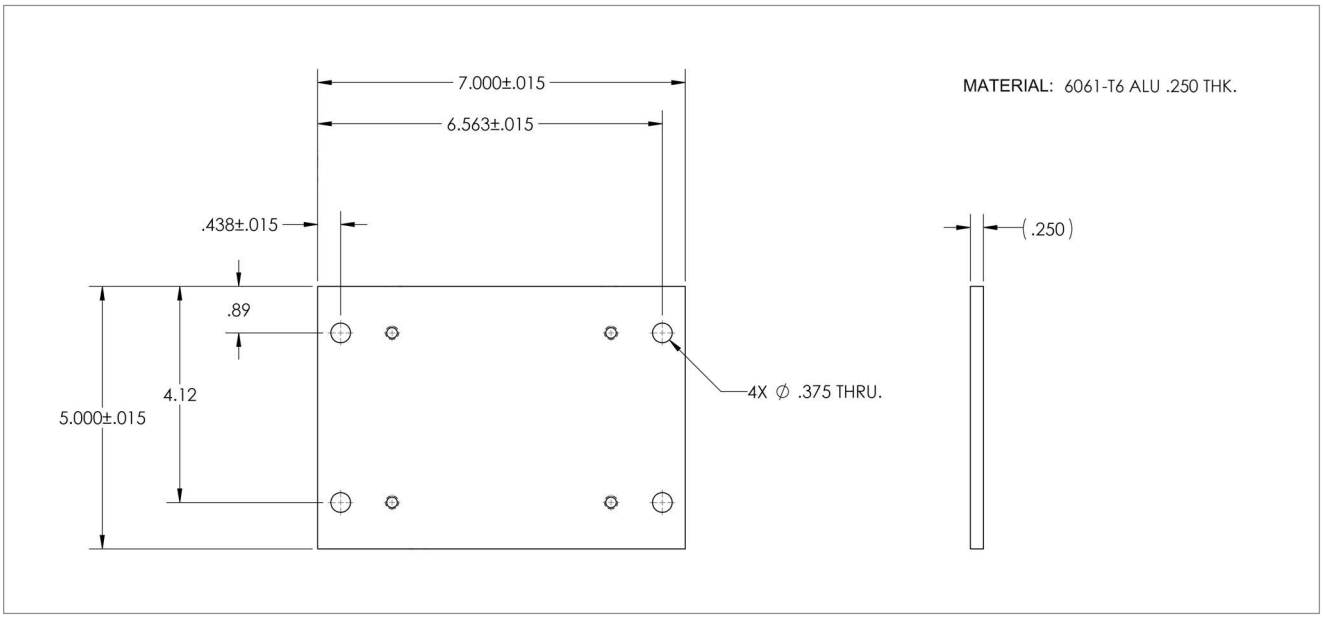


FIGURE 22: *Tilt (TLT) Models*

APPENDIX F. COMPONENTS (TYPICAL REPLACEMENT PARTS)

F.1 SINGLE-CHANNEL (01C) AND ADDRESSABLE (ADR) MODELS (NOT WATERPROOF)

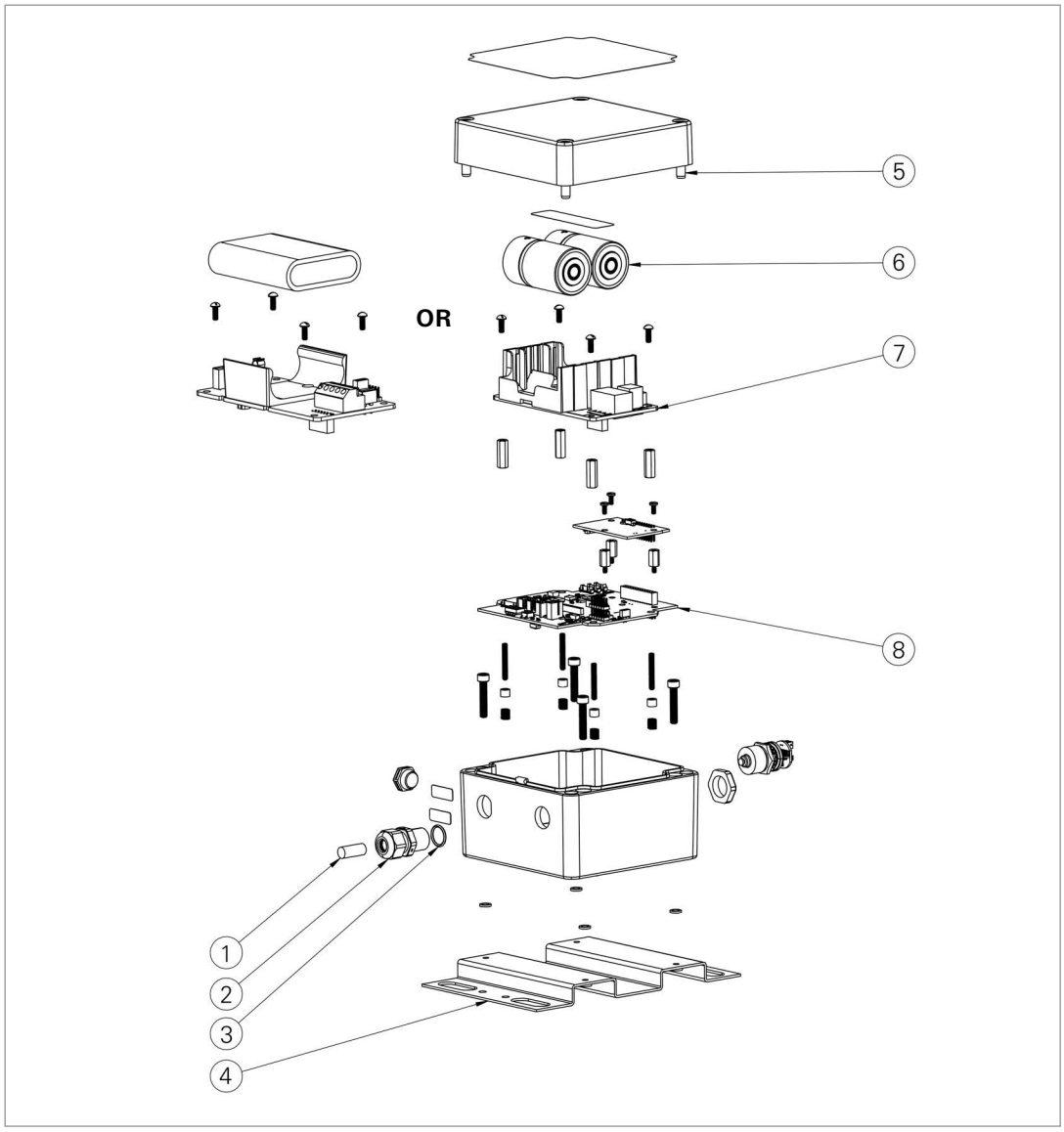


FIGURE 23: *Single-Channel (01C) and Addressable (ADR) Models*

Item No.	Part Number	Description
1	CON-A342	Dowel Pin
2	CON-A331	Cable Fitting
3	SEAL-09	Seal Ring for CON-A331
4	C8800-1	Mounting Bracket
5	HRD-A2009	M6 x 35 mm Allen Head Screw. When any replacements are required from the original screws, GEOKON recommends that all 4 screws are replaced.
6	Alkaline: S-BAT-111 Lithium: BAT-202 Rechargeable: BAT-207	Alkaline: Includes **two** D-Cell Batteries Lithium: Includes **one** D-Cell Battery (Two batteries are required for operation) Rechargeable: Battery Pack
7	Non-Rechargeable: S-8800-3 Rechargeable: S-PCB-0292	Battery Holder PCBA
8	S-8900-2A	GeoNet PCBA

TABLE 17: *Single-Channel (01C) and Addressable (ADR) Models Components Parts List*

F.2 FOUR-CHANNEL (04C) MODELS (NOT WATERPROOF)

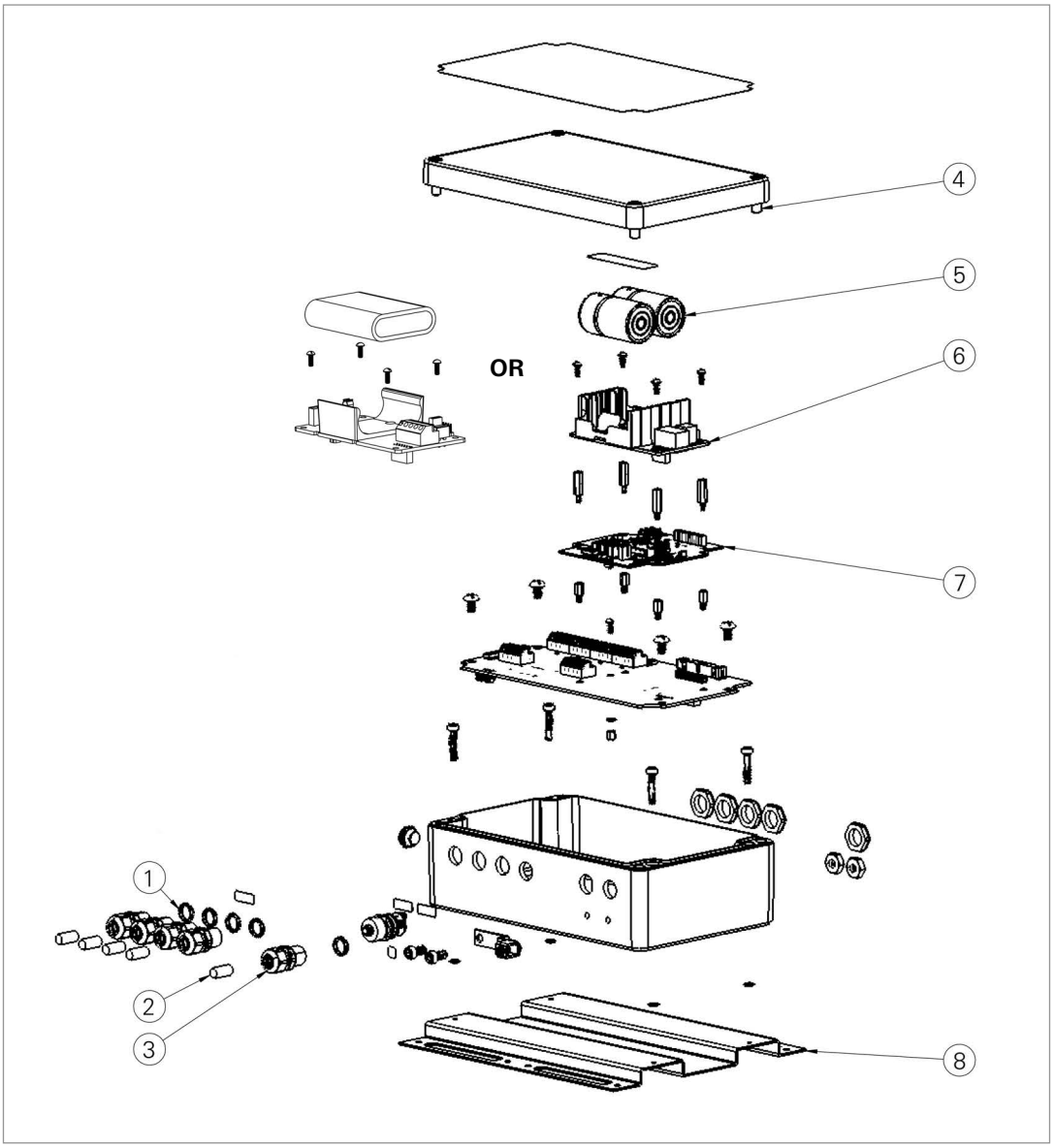


FIGURE 24: *Four-Channel (04C) Models*

Item No.	Part Number	Description
1	SEAL-09	Seal Ring for CON-A331
2	CON-A342	Dowel Pin
3	CON-A331	Cable Fitting
4	HRD-A2006	M6 x 25 mm Allen Head Screw. When any replacements are required from the original screws, GEOKON recommends that all 4 screws are replaced.
5	Alkaline: S-BAT-111 Lithium: BAT-202 Rechargeable: BAT-207	Alkaline: Includes **two** D-Cell Batteries Lithium: Includes **one** D-Cell Battery (Two batteries are required for operation) Rechargeable: Battery Pack
6	Non-Rechargeable: S-8800-3 Rechargeable: S-PCB-0292	Battery Holder PCBA
7	S-8900-2A	GeoNet PCBA
8	C8800-6	Mounting Bracket

TABLE 18: *Four-Channel (04C) Models Components Parts List*

F.3 EIGHT-CHANNEL (08C) MODELS

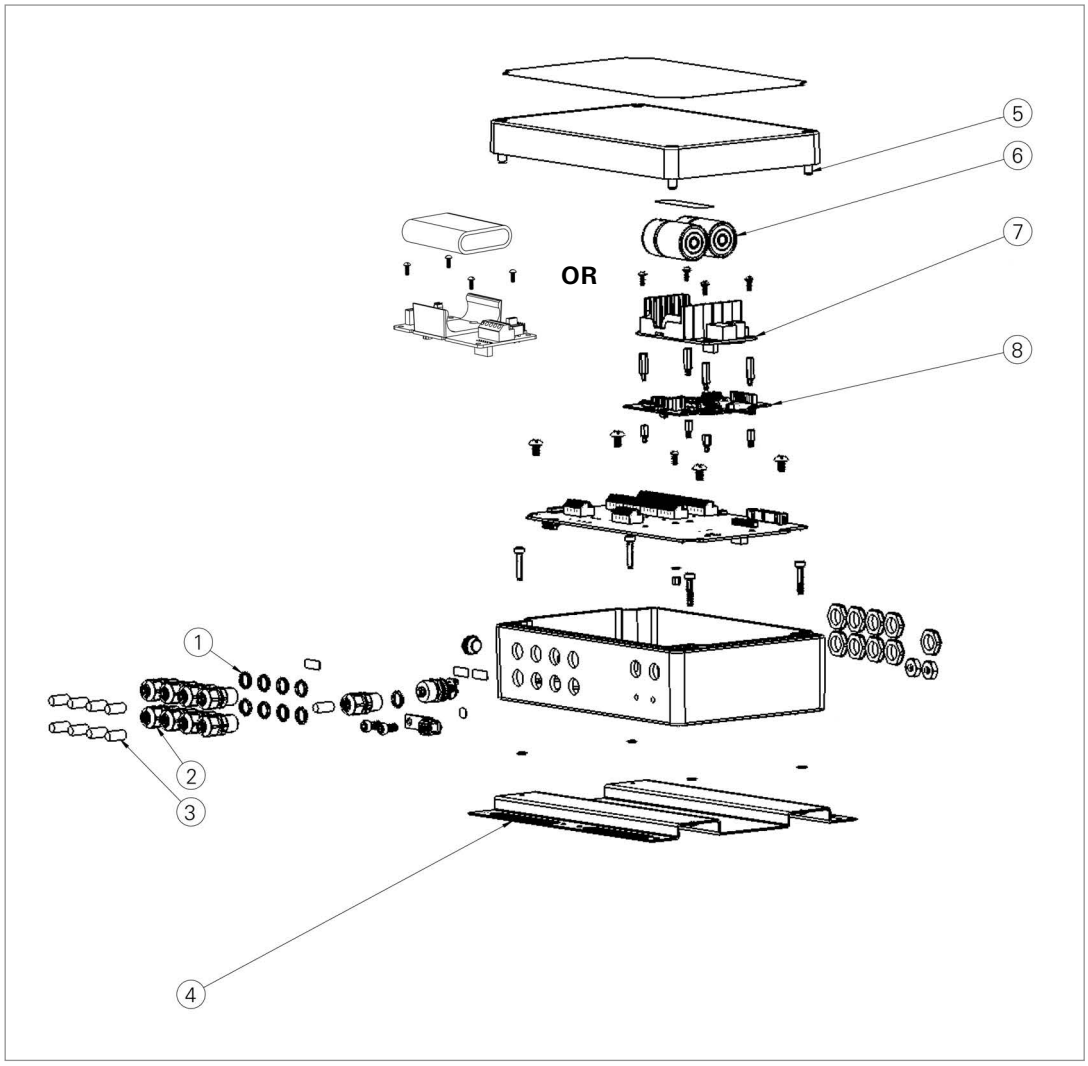


FIGURE 25: *Eight-Channel (08C) Models*

Item No.	Part Number	Description
1	SEAL-09	Seal Ring for CON-A331
2	CON-A331	Cable Fitting
3	CON-A342	Dowel Pin
4	C8900-1	Mounting Bracket
5	HRD-A2009	M6 x 35 mm Allen Head Screw. When any replacements are required from the original screws, GEOKON recommends that all 4 screws are replaced.
6	Alkaline: S-BAT-111 Lithium: BAT-202 Rechargeable: BAT-207	Alkaline: Includes **two** D-Cell Batteries Lithium: Includes **one** D-Cell Battery (Two batteries are required for operation) Rechargeable: Battery Pack
7	Non-Rechargeable: S-8800-3 Rechargeable: S-PCB-0292	Battery Holder PCBA
8	S-8900-2A	GeoNet PCBA

TABLE 19: *Eight-Channel (08C) Models Components Parts List*

F.4 TILT (TLT) MODELS

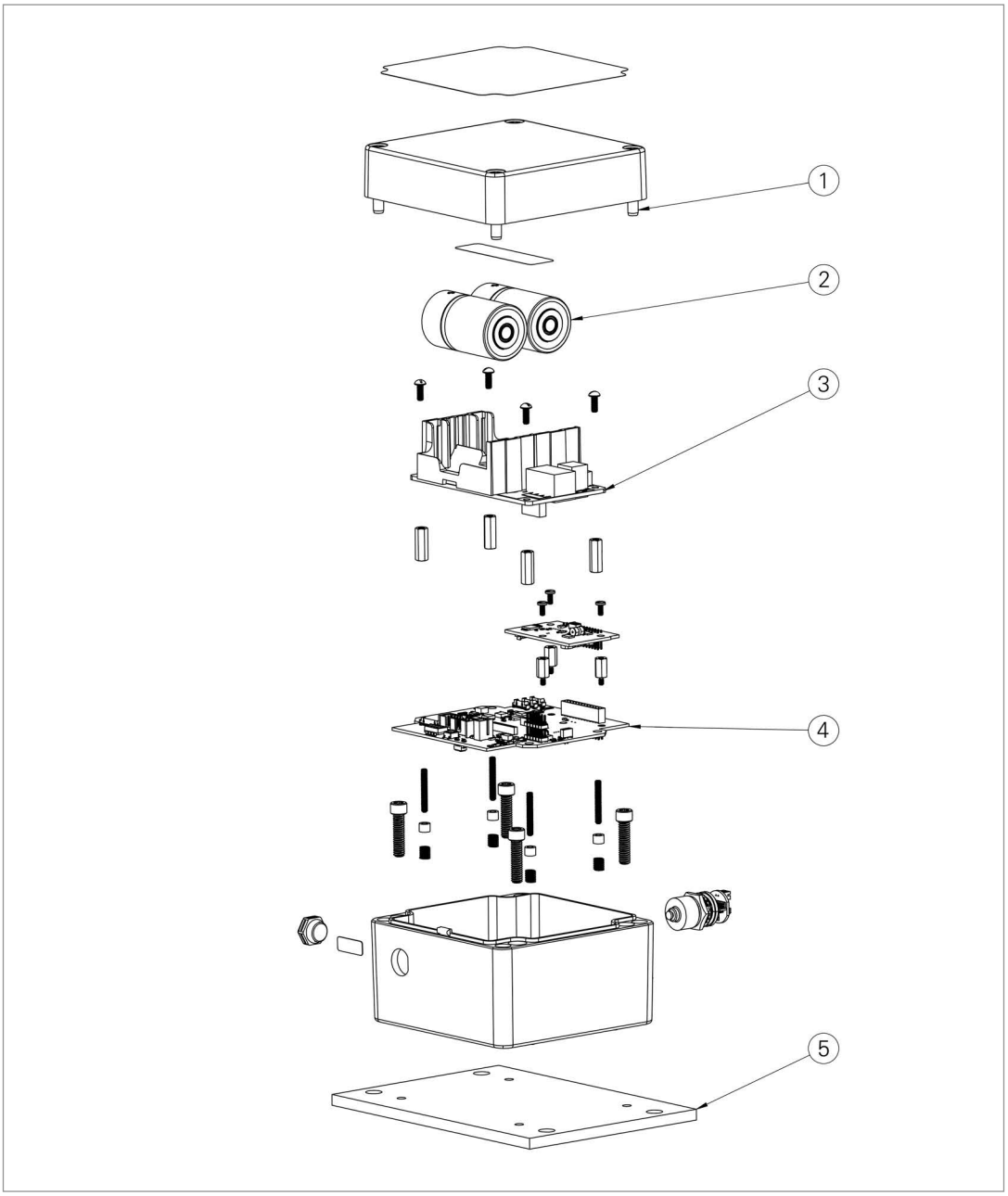


FIGURE 26: *Tilt (TLT) Models*

Item No.	Part Number	Description
1	HRD-A2009	M6 x 35 mm Allen Head Screw. When any replacements are required from the original screws, GEOKON recommends that all 4 screws are replaced.
2	Alkaline: S-BAT-111 Lithium: BAT-202	Alkaline: Includes **two** D-Cell Batteries Lithium: Includes **one** D-Cell Battery (Two batteries are required for operation)
3	S-8800-3	Battery Holder PCBA
4	S-8900-2A	GeoNet PCBA
5	A8101-3	Mounting Bracket

TABLE 20: *Tilt (TLT) Models Components Parts List*

F.5 WATERPROOF MODELS

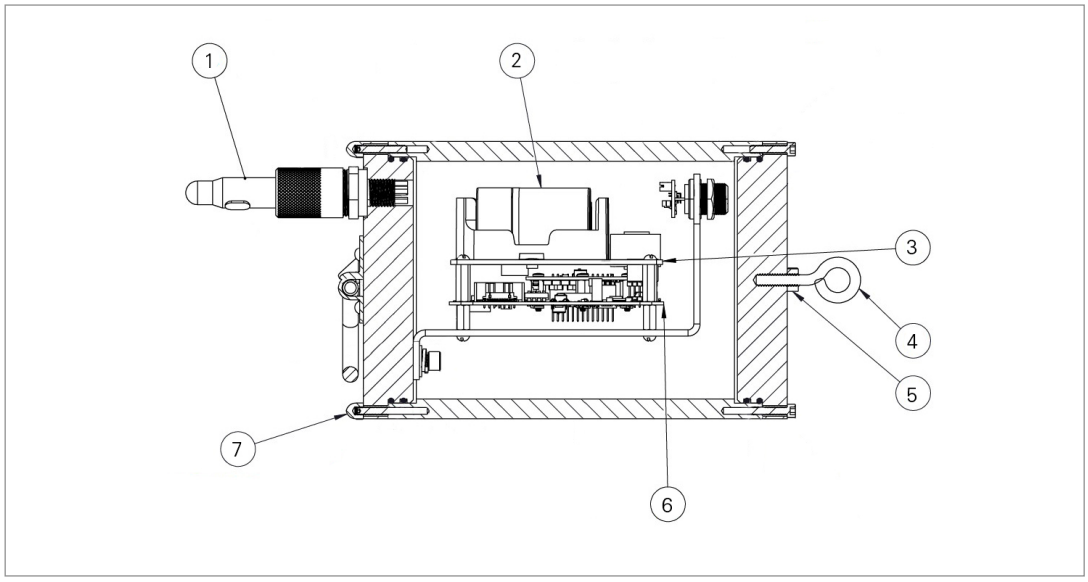


FIGURE 27: *Single-Channel Waterproof (01C-WP) Model*

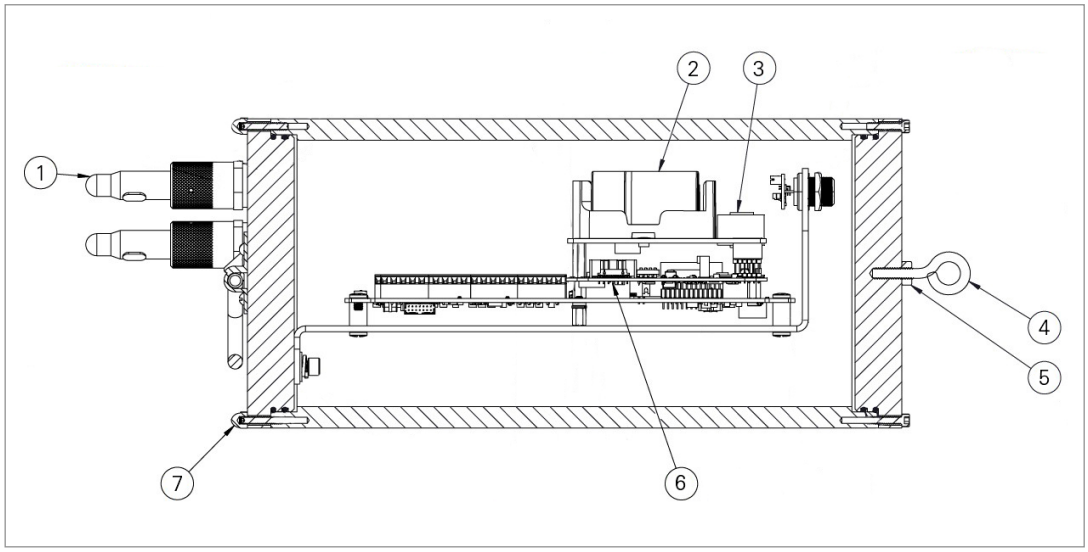


FIGURE 28: *Four-Channel Waterproof (04C-WP) Model*

Item No.	Part Number	Description
1	RMG-6-FSD	Female 6-Position Waterproof Connector
2	Alkaline: S-BAT-111 Lithium: BAT-202	Alkaline: Includes **two** D-Cell Batteries Lithium: Includes **one** D-Cell Battery (Two batteries are required for operation)
3	S-8800-3	Battery Holder PCBA
4	HRD-227W	Eye Bolt
5	HRD-203	Nut
6	S-8900-2A	GeoNet PCBA
7	HRD-A1964	Acorn Nut

TABLE 21: *Waterproof Models Components Parts List*

APPENDIX G. VIBRATING WIRE LOAD CELL WIRING

G.1 WIRING SINGLE LOAD CELL

8CH Interface[1]	Function	3-Gauge Load Cell Violet Cable	4-Gauge Load Cell Violet Cable	6 Gauge Load Cell Orange Cable
Channel 1 VW+	Gauge #1	Red	Red	Red
Channel 2 VW+	Gauge #2	Red's Black	Red's Black	Red's Black
Channel 3 VW+	Gauge #3	White	White	White
Channel 4 VW+	Gauge #4	NC	White's Black	White's Black
Channel 5 VW+	Gauge #5	NC	NC	Green
Channel 6 VW+	Gauge #6	NC	NC	Green's Black
Channel 1 SHD	Shield	All Shields	All Shields	All Shields
VW- Channels[2]	Common	White's Black[3]	Green	Blue
Channel 1 TH +	Thermistor	Green[3]	Blue	Yellow
Channel 1 TH -	Thermistor	Green's Black	Blue's Black	Yellow's Black

TABLE 22: *Single Load Cell Wiring*

Note:

[1] Where second Load Cell is being included, retain relative channel position count up from channel 5.

[2] Common "VW-" between all channels associated with each VW Load Cell

[3] White's black and Green wires are switched on GEOKON three-gauge VW load cells prior to serial number 3313.

G.2 LOAD CELL CONFIGURATION SWITCH SETTINGS

POS 1	POS 2	POS 3	Configuration
OFF	OFF	OFF	Std. No Load Cell
ON	OFF	OFF	One 3-Gauge Load Cell
OFF	ON	OFF	One 4-Gauge Load Cell
ON	ON	OFF	Two 3-Gauge Load Cells, second starting at channel 5
OFF	OFF	ON	Two 4-Gauge Load Cells, second starting at channel 5
ON	OFF	ON	One 3-Gauge Load Cell & One 4-Gauge Load Cell starting at channel 5
OFF	ON	ON	One 4-Gauge Load Cell & One 3-Gauge Load Cell starting at channel 5
ON	ON	ON	One 6-Gauge Load Cell

TABLE 23: *Load Cell Configuration Switch Settings*

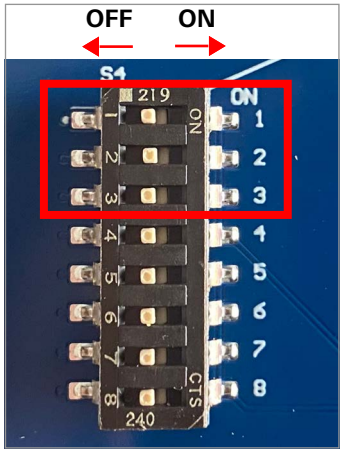


FIGURE 29: *Load Cell Configuration Switch*

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