

# **USERS MANUAL**

## **GEOTECH PVT REMOTE GATEWAY**



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## DOCUMENT HISTORY

Date	Comment	Sign
2015-09-09	Preliminary for proof reading.	mcn
2015-10-21	Added new items to 2.3. Editorial changes.	mcn
2015-11-03	New pictures.	mcn
2015-11-30	Revised 2.4, licencing of set-up software, solar panel, battery, charger.	mcn



# 1 General Information

## 1.1 Foreword

This manual contains important information for the proper use and safe operation of the equipment

Read the manual carefully before you start operating the system. Also read the maintenance instructions before performing any maintenance work. The warranty from Ingenjörfirman Geotech AB is valid only if the instructions in this manual are followed.

Always keep the manual by the equipment and replace it immediately if it should become wholly or partially unusable. A new copy can always be ordered from Ingenjörfirman Geotech AB.

### 1.1.1 Content

The information in this publication is on the basis of information that was available at the time that the publication was written.

The information can change at any time. Ingenjörfirman Geotech AB reserves the right to change or update the content of the manual without prior notice.

## 1.2 Safety

The user must be alert to potential hazards. The user should also have the necessary training, skills and tools to perform these functions properly.

The important safety messages in this manual are presented as follows:

 **DANGER**

**Indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

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 **WARNING**

**Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

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 **CAUTION**

**Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

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 **NOTICE**

**This warning identifies important messages in this manual, e.g. information on risk for costly damage. Carefully read the message and inform your colleagues.**

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## 2 Product Information

### 2.1 General Description

You can connect of up to eight piezometers to the gateway. It receives settings and sends logged data via the mobile phone network. Log in on the server web site from your office, or any other place with Internet access, for programming time between loggings, setting alarm levels or downloading log data.

The gateway box comprises a separate air pressure sensor and a rechargeable battery. The unrivalled energy saving features and low-leakage battery makes it possible to plan for long time between visits. The built-in battery can easily be exchanged upon visit or charged on site from via the separate USB charger.

The unit can optionally be equipped with a photovoltaic solar panel.

The gateway communicates with via the 3G cellular phone network. Subscription and SIM card to be provided locally by the customer (mini-SIM 25 x 15 mm). Please check coverage and compatibility with your service provider.

### 2.2 Application Examples



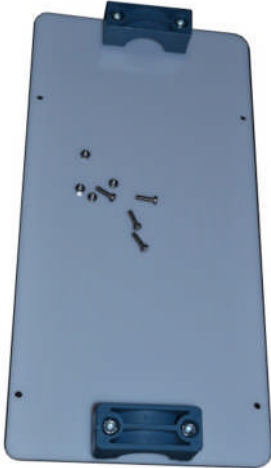


**Fig. 1 – Remote read-out solution example: Monitoring of pore pressure in clay at different depths under a road. The gateway receives settings and sends logged data via the mobile phone network.**

### 2.3 Intended use










The system is designed for geotechnical and hydrological monitoring, and may only be used for this purpose. All other use is prohibited.

## 2.4 System components overview

Item No.	Item	Illustration	Description
<b>Remote Gateway</b>			
28738	PVT Remote Gateway.		<p>Remote gateway for connection of up to eight piezometers. Including air pressure sensor, rechargeable battery and setup software.</p> <p>Prepared for charging from solar panel (not included).</p> <p>The gateway communicates via the 3G cellular phone network. Subscription and SIM card to be provided locally by the customer (mini-SIM 25 x 15 mm).</p> <p>Dimensions: 180 x 255 x 110 mm Weight: 2.2 kg</p>
(included in 28738)	PVT Gateway setup software.		<p>Software to be installed in your portable computer for set-up and trouble shooting. Refer to separate manual for details.</p> <p>License with right to use with one gateway.</p> <p><i>Medium for delivery may change without prior notice.</i></p>
<b>Accessories</b>			
28785	PVT Gateway mounting bracket		<p>Optional equipment for mounting the Gateway on a 1" pipe. Normally mounted on the Gateway when delivered.</p> <p>Dimensions: 180 x 365 mm Weight: 0.5 kg</p>





Item No.	Item	Illustration	Description
		<b>COMPATIBLE EQUIPMENT</b>	
		<b>Refer to separate manuals!</b>	
		<b>Direct push piezometers</b>	
10591	Piezometer with memory. 25 m wire.		Logging direct push piezometer with memory. Range 400kPa.
10590	Piezometer without memory. 25 m wire.		Direct push piezometer without memory. Range 400kPa.
27928	Piezometer with memory 2MPa.		Logging direct push piezometer with memory. Range 2MPa. Note: Cable length and type to be specified separately.
29029	Piezometer without memory 2MPa.		Direct push piezometer without memory. Range 2MPa. Note: Cable length and type to be specified separately.
19653	Piezometer cable		Standard cable for piezometer. Permanently mounted on piezometer from factory. Specify length upon ordering.
10663	Special cable PVT		Double insulated copper cable. Permanently mounted on piezometer from factory. Specify length upon ordering.
On request	Direct push piezometer with special characteristics available on request.		Direct push piezometer with special characteristics available on request.
		<b>Piezometer for membrane filter tip or open standpipe</b>	
20500	Electronic transducer		Portable electronic pressure transducer with needle for filter tip 12912, 24560 and similar.  Can also be used without the needle for water level measurements in open standpipe.
12912	Filter tip, Stainless steel.		Filter tip – closed type with membrane. Stainless steel. Connection pipe included.
24560	Filter tip, plastic		Filter tip – closed type with membrane. Plastic. Connection pipe included.

*The GEOTECH PVT product family is being continuously developed and improved. We therefore reserve the right to changes of the information above.*

## 2.5 Geotech PVT Remote Gateway.



**Fig. 2 – PVT Remote Gateway with optional mounting bracket for 1” pipe.**

The standard gateway supports up to **8 connected piezometers** and comes encased in a plastic cabinet/box including a rechargeable battery with capacity for 6 months. Power consumption calculation is based on time between loggings=1 hour; time between sending log file to the server=12hours. Capacity might be reduced if used in very cold environment. If you need longer time between visits or more frequent loggings/updates, we suggest installation of the optional photovoltaic solar panel.



**Fig. 3 – PVT Remote Gateway comprising small box with electronics, battery, antenna and terminal block.**

The equipment comprises an internal casing with all electronics (below “small box”). The small box should only be opened under dry conditions for installation of your SIM card. It is protected inside an external casing (below “big box) together with terminal blocks, battery and antenna. A thin plastic hose connects the built-in air pressure sensor with the external atmosphere.

### 2.5.1 Technical Data

Please refer to separate document for description of additional equipment

Remote communication:	3G Cellular. Please check coverage with your service provider!
Internal sensors:	GPS, temperature, air pressure, moisture. Functionality limited by software.
Accuracy internal GPS:	For indication only.
Accuracy internal temperature sensor:	$\pm 1^{\circ}\text{C}$ .
Accuracy internal air pressure sensor:	$\pm 0.2 \text{ kPa}$ .
Accuracy internal moisture sensor:	For trouble shooting only.
External sensors:	Up to 8 "Geotech PVT Piezometers" may be connected (standard). Other configurations on request.
Set-up computer (not included):	"PVT Gateway setup software" to be installed on the customer's portable standard MS Windows computer with USB outlet. Separate USB cable required. Refer to separate documents.
Battery type:	Rechargeable 3.6 V, 6600 mAh "Lithium Ion Battery". Please read safety instructions!
Battery capacity:	6 months use with 4 piezometers connected; time between loggings = 1 hour; time between sending log files to the server = 24 hours. Capacity could be reduced if used in very cold environment.
Battery charging time:	12 hours with "PVT Gateway battery charger".
Dimensions (nominal):	400mm x 300mm x 180mm.
Mounting:	Mounting bracket for 1" standard size water pipe on request.
Weight:	Refer to chapter 2.4 above.

*Specifications are subject to change without notice.*

## WARNING

### Equipment containing Lithium Ion Batteries

**The gateway is powered by a Lithium Ion battery that must be handled with care as a flammability hazard exists. Do not short-circuit, mishandle or disassemble the battery.**

## WARNING

### Equipment containing Lithium Ion Batteries

**When sending a gateway together with maximum one spare battery by air, the package must have a warning label and safety information. Please refer to appended transport instructions and rules issued by your forwarder. Special rules apply to batteries not sent together with the equipment. Never send damaged batteries by air.**

## 2.6 Additional product information

Please refer to separate document for description of additional equipment.

# 3 Installation

## 3.1 Required equipment

For the Gateway:

Medium size screw driver (slot)

Small screw driver (slot)

Pliers (for cutting and stripping wire).

USB cable

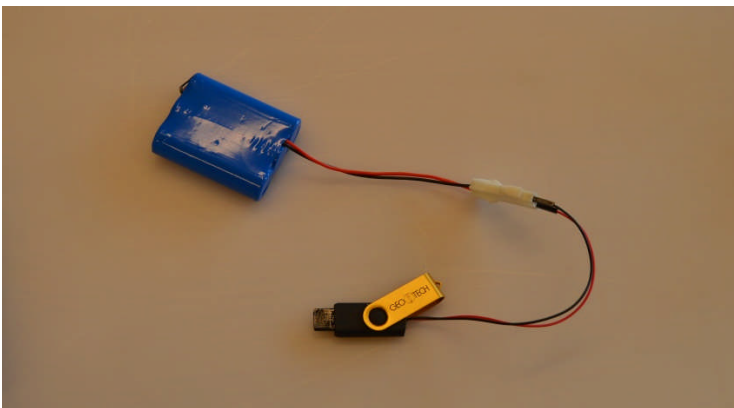
Portable computer with installed "PVT Gateway setup software"

SIM card and information from your service provider: phone number, PIN code, APN code etcetera.

For the optional mounting bracket:

Hex key (Allen key) 5 mm

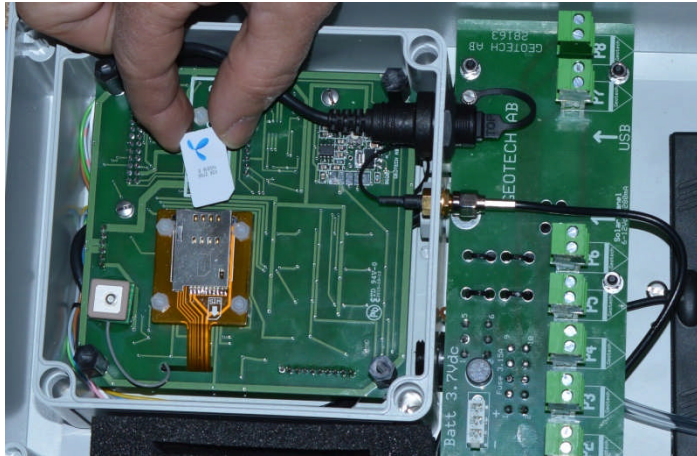
## 3.2 Preparations



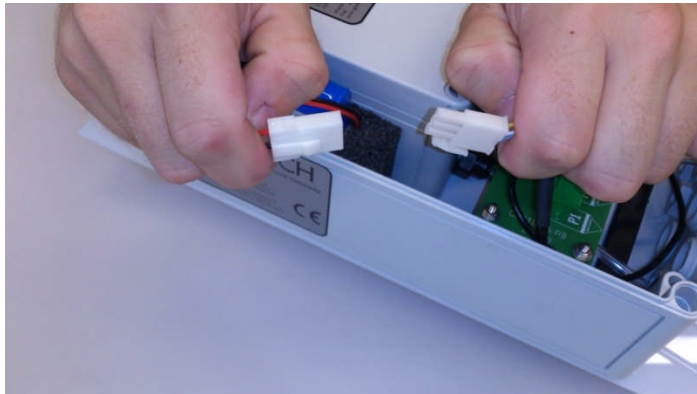
Charge the battery for at least 12 hours before installation.



Open the "big box".



Open the “small box” and insert the SIM card. Make sure that you have access to information about PIN code, APN code etcetera connected to your subscription.



Close the “small box” and connect the battery.

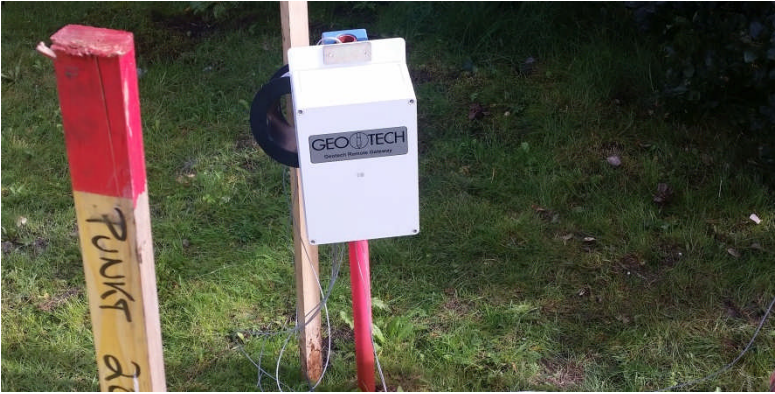


Remove the protection lid from the micro USB outlet and connect your computer with installed “PVT Gateway setup software”.

Start up the software and perform set-up of the Gateway (refer to User’s Manual for “PVT Gateway setup software”).



### 3.3 Installation



Mount the Gateway vertically with cable outlets facing down. Bracket for mounting on a 1" standard size water pipe is available as option.

Insert piezometer cables and connect them to the terminal blocks. If used outdoors, please pay attention to the water tightness of the gaskets.

You may now set up and check gateway and sensor properties (refer to User's Manual for "PVT Gateway setup software").

Remove the USB cable and mount the micro USB outlet protector.

Close the "big box".

## 4 Maintenance

### 4.1 Charging of batteries

It makes sense to have access to a spare battery. Charge the battery for 12 hours, using the "PVT Gateway battery charger". The gateway will keep its settings for a few seconds. If settings are lost by the gateway, they will be restored upon next contact with the server.

#### **! WARNING**

##### **Equipment containing Lithium Ion Batteries**

**The gateway is powered by a Lithium Ion battery that must be handled with care as a flammability hazard exists. Do not short-circuit, mishandle or disassemble the battery.**

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#### **! WARNING**

##### **Equipment containing Lithium Ion Batteries**

**When sending a gateway together with maximum one spare battery by air, the package must have a warning label and safety information. Please refer to appended transport instructions and rules issued by your forwarder. Special rules apply to batteries not sent together with the equipment. Never send damaged batteries by air.**

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## 4.2 Authorized Workshops

For support and repair please contact:

Ingenjörfirman Geotech AB  
Datavägen 53  
SE- 436 32 Askim  
SWEDEN

info@geotech.se  
+46 31 289920

For customs reasons, please declare **serial number** of the Gateway if sending it for service. Please refer transport instructions for Lithium Ion Batteries. Never send damaged Lithium batteries by air.

## 4.3 Trouble Shooting

*The trouble shooting table below is not complete, nor subject to any quality assurance, and thus published as indication only. Please feel free to revert with additional questions and suggestions.*

<u>Issue:</u>	<u>Finding possible causes:</u>	<u>Actions:</u>

## Appendix 1

### Transport instructions for “Remote Gateway”

The Geotech PVT Remote Gateway is powered by a rechargeable Lithium-Ion battery. The standard battery has energy content not exceeding 100 Wh. Each cell has energy content not exceeding 20 Wh.

When sending by air, the package must have a warning label and safety information. Each gateway may normally be shipped together with one spare battery. Special rules apply when sending batteries alone without the equipment. Do not send defect or damaged batteries by air. Before sending the equipment, please check applicable rules with your forwarder.



#### **Equipment containing Lithium Ion cells or batteries**

The package must be handled with care as a flammability hazard exists. The package should not be damaged or mishandled. If the package is damaged special procedures should be followed; this should include inspection and re-packaging if necessary. Do not load or transport package if damaged.

For more information, call +46 31 289920.







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