

Aardvark Permeameter - Automated Permeability Measurements

# New



# Fast and Accurate

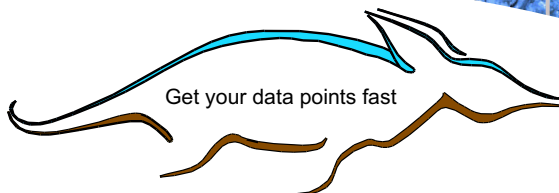
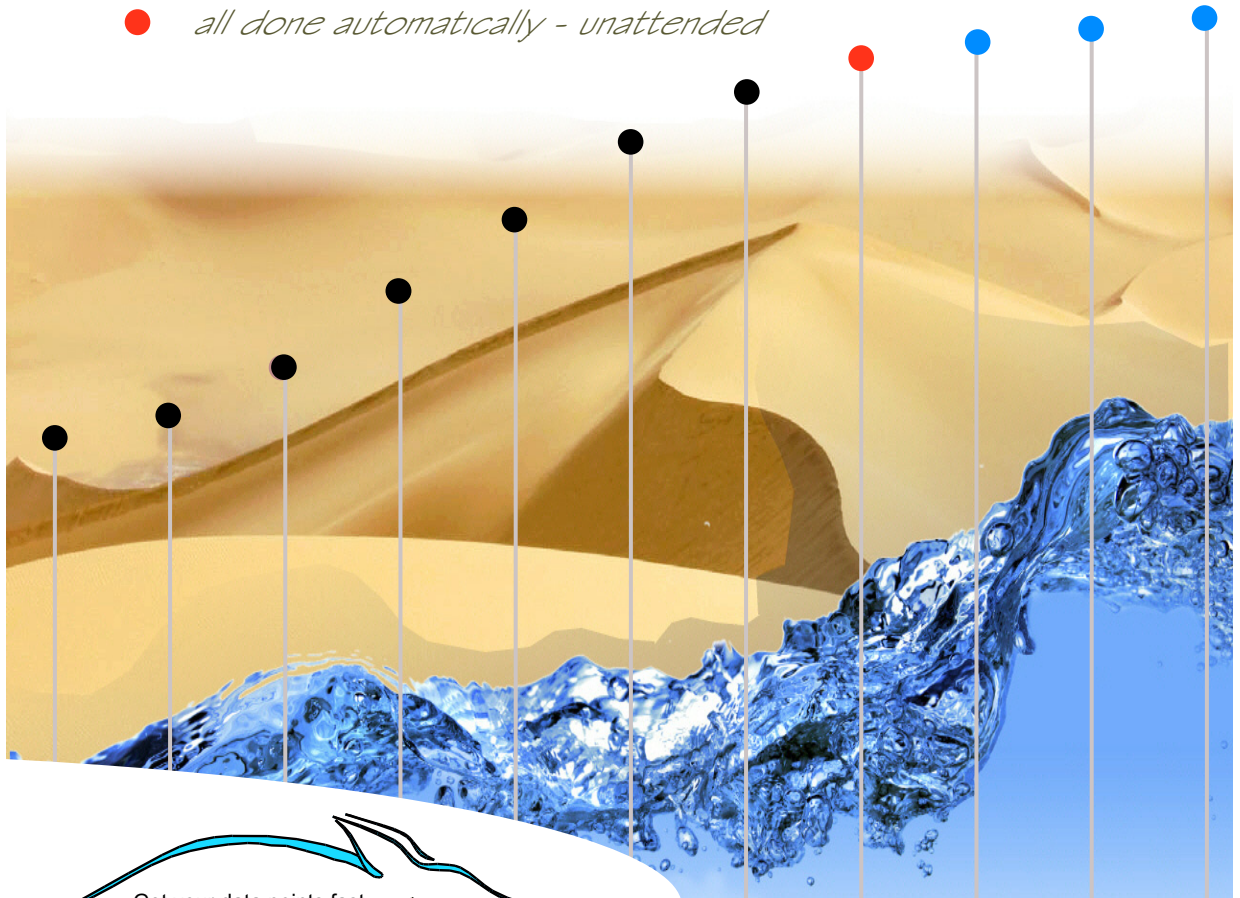
For the first time ever you can automate your permeability measurements using direct water usage to 0.2 ml accuracy. It comes as a complete kit with everything you'll need and then some. Field record your data on our battery powered RIF - Record it In a Flash (using common Flash Drives) or your own laptop or Windows pad.

Specialized software, our SimplyDATA software suite comes with the kit and tells you when you've reached steady state and even calculates the results. This is all done using a minimum of water and your valuable time.

LOOK INSIDE TO FIND OUT MORE ABOUT THIS  
OUTSTANDING NEW INSTRUMENT FROM SOILMOISTURE

*Steady state results in minutes instead of hours*

- *all done automatically - unattended*



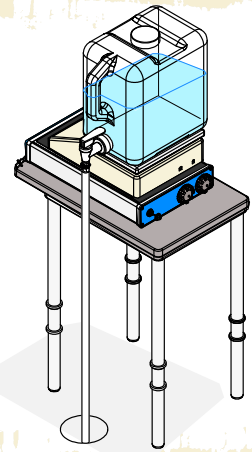
**PATENT PENDING**

# Aardvark Permeameter the Premium Permeameter

## An Elegantly Simple Idea

For many the idea of making a Permeameter measurement includes lots of work and time in setting up complicated, delicate devices. Seldom rugged almost never self automated, and if any automation or data logging is involved, it requires calibration of pressure transducers, recording temperature variations, and hoping for no long term drift. Generally put, it requires someone in attendance recording values, constantly "baby sitting" the device in the field.

Aardvark breaks that mold with very simple equipment, very rugged field hardened, that quickly hooks up in the field in less than 15 minutes. Fill the plastic reservoir and start the digital scale, open the valve and start logging. Once steady state is reached the unit alerts you and has already computed the  $K_{sat}$  values. What could be simpler?



## What can I use an Aardvark Permeameter for ?

### ● RUNOFF VALUES

*Knowing how much water your soil is capable of adsorbing from a steady supply of water like rain is extremely important. If rain is coming down at a rate greater than the soil can adsorb (it's  $K_{sat}$  value) then the excess will become "runoff". Knowing the area of soil under these conditions can provide local and regional figures to predict overall runoff and flooding.*

### ● PONDING CAPABILITIES

*If you are designing a structure to "recharge" ground waters by a ponding area overhead it would be a good practice to know with certainty the soil's hydraulic capability to transmit that water. The measured  $K_{sat}$  value gives you that*

### ● LEACHLINE SPACING

*In designing or assessing a sewer system employing leach lines it's important to know the minimum spacing possible for the sites specific soil type. To determine that minimum distance, you'll need to know the capacity of the soil to transfer maximum residual sewer water from catchment basins to outlying leach lines. You'll need to know the  $K_{sat}$  values.*

### ● IRRIGATION SCHEDULING

*Perhaps the most important use of Aardvark is in helping determine the length of irrigation cycles over a growing season. If you're irrigating row crops with developing rooting depths you will want to know how far that wetting front will take to reach maximum rooting depth. In doing so you save on water, fertigation and pumping costs, this by not overwatering or possible quality losses from under watering. With good reliable  $K_{sat}$  values you can estimate irrigation*

### ● DRAINAGE REQUIREMENTS

*By knowing your runoff per unit area it's easy to calculate the drainage capacity requirements to drain and mitigate field areas. Find the maximum historic rainfall event, know your  $K_{sat}$  and apply the appropriate drainage design.*

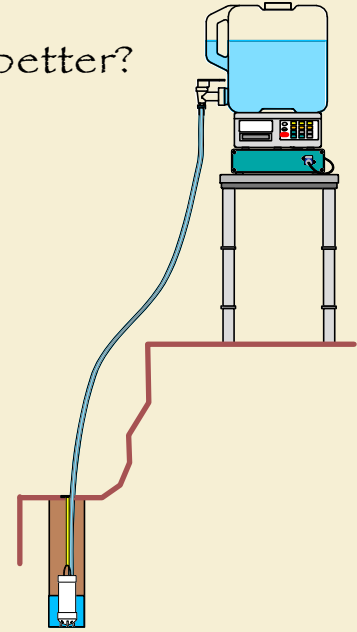


# Simple, Fast, Automated and Cost Effective

## What makes an Aardvark work so much better?

- Reaches Almost Anywhere

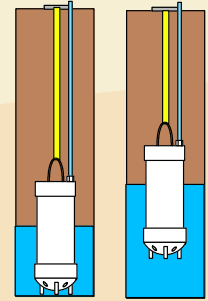
The Aardvark System is a dedicated - constant head well Permeameter for use from near surface to depths of 50 ft. or more. Many systems were designed for only near surface measurements using Marriott bubbler technology. In most cases if any automation was involved it used pressure / vacuum transducers. Aardvark is a direct reading of actual water consumption. Aardvark uses regulator technology and precision valves to maintain a constant head from shallow to the full depths of 50 ft. The regulator unit included in the K2 kits assures a constant pressure head even at extensive depths of 50 ft.



- Quick to work, Quick to get results



Because all connections are quick click, and connections to the Aardvark are made via clear flexible tubing, deployments go very quickly - with setup in less than 15 min. The unit is connected and tethered by a high strength measuring tape so you always know the depth of insertion. For multiple height measurements simply pull up on the tape to establish a new head height.



- Soilmoisture - Simply DATA Software Suite - Upgradable - USB portable



Perhaps the most advanced feature in our Aardvark collection is our SimplyDATA flash drive that comes with each kit. Connected to a Laptop, Tablet, or PC running Windows XP or 7 or our SimplyDATA RIF unit, it logs Permeameter reservoir weight, weighing it periodically as you programmed, looking for steady state flow rate. You will be alerted when Aardvark has reached steady state conditions, having already calculated the saturated conductivity on the spot. What could be easier?

- Measure Water Directly - to 0.2 ml.

Of course there is the point of being this precise and accurate - - nothing beats the direct weighing of water actually consumed in reaching steady state equilibrium. Transducers are often fraught with temperature variations, drift, and reoccurring calibration demands. Using the SimplyDATA digital scale you can accurately weigh water to 0.2ml (0.2 gm) assuring you of precision graphs and data documenting any measurement. Of course you can still read the reservoir by eye but it won't be nearly as accurate and you'll need a pad or tablet (the older version made from paper). Add in a GPS coordinate in our software as a reminder of just where you took all those measurements.



# Amazing Software for Permeameter Measurements and Weight

Sophisticated Software data logs to a PC or flash drive

**Water Consumption Rate** | Total Water Consumed

ml per minute

8:05 AM 9:45 AM 11:25 AM

Time	Reservoir Water Level	Elapsed Time Interval	Interval Water Consumed	Total Water Consumed	Water Consumption Rate	Ignore this Reading
8:00:00 AM	-738 ml					<input type="checkbox"/>
8:05:00 AM	-1238 ml	5 minutes	500.0 ml	500.0 ml	100.0 ml/min	<input type="checkbox"/>
8:10:00 AM	-1567 ml	5 minutes	329.0 ml	829.0 ml	65.80 ml/min	<input type="checkbox"/>
8:15:00 AM	-1770 ml	5 minutes	203.0 ml	1032.0 ml	40.60 ml/min	<input type="checkbox"/>
8:20:00 AM	-1903 ml	5 minutes	133.0 ml	1165.0 ml	26.60 ml/min	<input type="checkbox"/>
8:25:00 AM	-1981 ml	5 minutes	78.0 ml	1243.0 ml	15.60 ml/min	<input type="checkbox"/>
8:30:00 AM	-2030 ml	5 minutes	49.0 ml	1292.0 ml	9.80 ml/min	<input type="checkbox"/>
8:35:00 AM	-2068 ml	5 minutes	38.0 ml	1330.0 ml	7.60 ml/min	<input type="checkbox"/>
8:40:00 AM	-2107 ml	5 minutes	39.0 ml	1369.0 ml	7.80 ml/min	<input type="checkbox"/>
8:45:00 AM	-2145 ml	5 minutes	38.0 ml	1407.0 ml	7.60 ml/min	<input type="checkbox"/>
8:50:00 AM	-2183 ml	5 minutes	38.0 ml	1445.0 ml	7.60 ml/min	<input type="checkbox"/>
8:55:00 AM	-2220 ml	5 minutes	37.0 ml	1482.0 ml	7.40 ml/min	<input type="checkbox"/>
9:00:00 AM	-2258 ml	5 minutes	38.0 ml	1520.0 ml	7.60 ml/min	<input type="checkbox"/>
9:05:00 AM	-2296 ml	5 minutes	38.0 ml	1558.0 ml	7.60 ml/min	<input type="checkbox"/>
9:10:00 AM	-2333 ml	5 minutes	37.0 ml	1595.0 ml	7.40 ml/min	<input type="checkbox"/>
9:15:00 AM	-2370 ml	5 minutes	37.0 ml	1632.0 ml	7.40 ml/min	<input type="checkbox"/>
9:20:00 AM	-2408 ml	5 minutes	38.0 ml	1670.0 ml	7.60 ml/min	<input type="checkbox"/>
9:25:00 AM	-2445 ml	5 minutes	37.0 ml	1707.0 ml	7.40 ml/min	<input type="checkbox"/>

Steady Flow Rate Condition

Steady Flow Rate achieved when Water Consumption Rate changes less than +/- 3.0 ml for 9 consecutive readings

Steady Flow Rate: 7.49 ml/min  
Percolation Rate: 41.95 min/cm  
Ksat: 2.3643E-7

Site GPS Position

Longitude: 0 0 0 East  
Latitude: 0 0 0 North

Hole Diameter: 20 cm  
Water Temperature: 21 °C  
Hole Depth: 80 cm  
Water Height in Hole: 30 cm  
Water Table Depth: 500 cm

Soil Texture-Structure Category:

Begin Weighing Clear Readings Save Readings Aardvark Permeameter Soil Texture Logging Module List Weighing Sequential Weighing Periodic Weighing Close

As you can gather by the screen shot shown above, Aardvark software provides every aspect of documenting a Permeameter measurement. There are input cells for location, descriptions, and naming practices that include GPS designations to pinpoint geographically where your important measurements were made. Then there's the detailed logging table that shows the recorded data set taken automatically with the SimplyDATA digital scale connected to a PC or directly from a Flash Drive attached to a RIF data logger. Of course you can enter the data by hand for a non-automated entry. Even manually entered data is analyzed and compared to earlier readings looking for a steady state condition, automatically highlighting (darkening) that portion of the data set that represents steady state conditions. No decent technical software would be acceptable without a good graph or two of the action as it happens. In our Aardvark software we have two: One shows water consumption rate, the other shows total water consumed. Points on the graphs show exactly when steady state was achieved letting you know how long it took to reach steady state and the water it took to get there. The software provides comprehensive set of documentation features and analysis choices to compliment the very efficient and quick measurement process.

# 6 Possible Kit Selections to meet every need

## Measurements to 10 Ft. Depth



Model 2840 K1

For Manual Measurements to 10ft. depths

This kit comes with everything shown above as well as software on a flash drive, operating instructions and carrying case.

- Adjustable Table
- Aardvark Unit
- 8 Liter (2 Gal) Reservoir
- 50 Ft. Measure Suspension Tape
- 50 Ft. Connecting Tubing
- Tubing Holder Clamp
- Measuring Tape Holder
- 60 Minute Timer
- "Rite in Rain" Tablet & Pen
- Care Kit (Extra Parts)



Model 2840 K1PC

For Automated Measurements to 10ft. depths using a Windows PC or Tablet

This kit comes with everything shown above as well as software on a flash drive, operating instructions and carrying cases.

- 7201W10PKG - USB Digital Scale
- Adjustable Table
- Aardvark Unit
- 8 Liter (2 Gal) Reservoir
- 50 Ft. Measure Suspension Tape
- 50 Ft. Connecting Tubing
- Tubing Holder Clamp
- Measuring Tape Holder
- 60 Minute Timer
- "Rite in Rain" Tablet & Pen
- Care Kit (Extra Parts)



Model 2840 K1RIF

For Automated Measurements to 10ft. depths using an RIF unit that automates and captures data in the field on a Flash Drive

This kit comes with everything shown above as well as software on a flash drive, operating instructions and carrying cases.

- 7205 RIF Record it in a Flash Recorder
- 7201W10PKG - USB Digital Scale
- Adjustable Table
- Aardvark Unit
- 8 Liter (2 Gal) Reservoir
- 50 Ft. Measure Suspension Tape
- 50 Ft. Connecting Tubing
- Tubing Holder Clamp
- Measuring Tape Holder
- 60 Minute Timer
- "Rite in Rain" Tablet & Pen
- Care Kit (Extra Parts)

## Measurements to 50 Ft. Depth



Regulator Unit

Model 2840 K2  
Manual Measurements  
to 50 Ft.

- Added 2840-2000 Regulator Unit
- Includes all Model 2840K1 items as well

Aardvark Unit

Model 2840 K2PC  
Automated Measurements  
using a PC to 50 Ft.

- Added 2840-2000 Regulator Unit
- Includes all Model 2840K1PC items as well

Model 2840 K2RIF  
Automated Measurements  
using an RIF to 50 Ft.

- Added 2840-2000 Regulator Unit
- Includes all Model 2840K1RIF items as well



# You can purchase these options separately if need be

We have made it easy to purchase only what you want and add these options at a later date if you so choose. These items ordered separately will be slightly more expensive than had you purchased the items as part of an Aardvark packaged kit. Each of these items described below are the same items incorporated into the Aardvark Permeameter packages.



Comes with Simply DATA Software Suite



USB Digital Scale - 10 Kg .2gm (.2ml) units

## SimplyDATA Scale - Model 7201W10PKG

This scale does everything you'd expect of a precision digital scale. You can easily tare containers, reservoirs of all types. You can pick your units of measure from english to metric. It can even be taught to count and of course remember a past weighing. Temperature compensated, taking 6ea. AA standard batteries this scale is ready for remote field use. It comes with SimplyDATA software suite on a flash drive, USB connectable to any PC running standard Windows applications. It communicates via the PC or Flash to provide itemized data for Aardvark analysis, and comes with additional applications for list weighing, sequential weighing, and programmable timed weighing. Get started in automating your weighing.



Comes with Simply DATA Software Suite



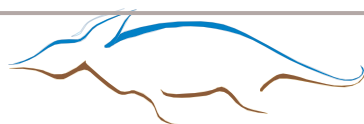
USB Digital Flash Recorder/Logger

## SimplyDATA RIF - Model 7205RIF PKG

The RIF (Record it In a Flash) is a standalone battery operated, programmable, logger/recorder of devices having a qualified USB output. Using Simply DATA software and SimplyDATA digital scale output logging it directly into the Soilmoisture flash drive provided. The top USB port on the RIF interfaces with the flash drive which carries the setup information and applications, including pre-programmed logging schedules. If you forgot to do the pre-programming in the lab or office you can program the RIF directly in the field. The lower USB port is for the Simply Data digital scale input or another qualified USB device. On the standard 2 GB capacity flash supplied you can log and log without filling up the unit. Of course we offer larger denominations. We'll be qualifying other USB

## Model 2840-2000 Aardvark Regulator Unit

If you purchased a K1 and now want to reach greater depths by adding the Aardvark Regulator Unit you can do so by simply purchasing the unit separately. It works with all K1 kits. Simply put the Regulator Unit on top of the Aardvark unit (it comes with an attachment link and interconnect tube and your ready to tackle measurements to 50 ft. depths.



# Each Kit a Complete Permeameter Package

2840K1



This is our basic package. It comes with everything needed to make manual readings. Data can be entered into the Aardvark software on the flash drive provided. It's all cased and ready for field work. Measurements to 10 ft.

2840K2



This package too, is a basic unit for manual readings. The K2 incorporates a Regulator Unit (outlined in yellow) allowing deeper depth measurements. Data can be entered into the Aardvark software on the flash drive provided. Measurements to 50 ft.

2840K(1 or 2) PC



2840 PC Versions - Automated Measurements.

This package incorporates the 7201W10 Digital Scale with USB outputs. By adding this very important element it makes it possible to auto log directly to a field PC, Laptop, or Tablet that supports full Windows operating systems. Everything in the Aardvark family is battery operated so that it can function without household power remotely in the field, that includes the Digital Scale. Whether you choose the K1 (10 ft.) or K2 (50 ft. - with Regulator Unit) you're assured of quick and accurate automated permeameter measurements with Aardvark software. The scale also has additional software functions to allow for list weighing, sequential or timed weighing. A definite advantage for the professional consultant or educator. Everything is cased and ready for the field.

2840K(1 or 2) RIF



2840 RIF Versions - Recorded & Automated Measurements

This package provides the ultimate solution for those that want a dedicated highly mobile system for making repetitive permeameter measurements in the field or lab. The incorporation of the RIF (Record it In a Flash) logging and data collecting unit with the 7201W10 digital scale provides complete autologging capability in the field. You can easily "setup" the RIF on your PC prior to use or simply program it in the field. The RIF - USB port logs and keeps all your timed measurement readings from the scale on the included flash drive. The RIF even signals when you've reached steady state so you don't need to "keep checking", just listen for the signal...the RIF's keeping track of the ongoing measurement routine. Whether you choose the K1 (10 ft.) or K2 (50 ft. - with Regulator Unit) your assured of quick and accurate automated permeameter measurement, with the included software. No need to dedicate a PC. The RIF keeps track of it all on the flash drive. It assures that a variety of users, assistants, field technicians, consultants and others have the best possible permeameter tool available, rugged, field proven, assuring you a consistent quality result.

0237D10L12



0237D10L12 Field Auger Set

To round out your well type permeameter measurement system why not include the complete Auger kit specifically developed for the Aardvark. It includes everything you need and is packed in a easily totable carrying case. (makes a 4 in. [10 cm] dia hole x 12 ft. deep)



We believe that the Aardvark Permeameter, as well as our other permeameters, will serve the needs of the most discriminating and demanding scientist or commercial consultant with a new tool that exceeds their requirements. Long life and durability are a hallmark of Soilmoisture design and manufacture, which means that you get maximum value for the money spent. Over the upcoming months and years we will be adding additional features for both the permeameters and our auxiliary units such as the digital scale and RIF device incorporated in your K2 Permeameter Kits, the Digital Scale and software suite. Additional items coming in the near future will be field equipment for determination of soil texture, that includes battery powered sieve shakers, and Stoke's small soil particle analysis.

Should you have any additional comments, suggestions or questions please call for help in any of these areas as we are always interested in your comments and suggestions.



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**SOILMOISTURE EQUIPMENT CORP.**

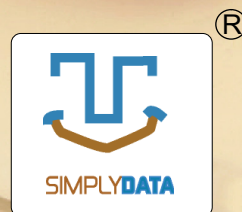
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