

USER GUIDE

EC-09, EC-09-400 Platemeters



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Introduction

Congratulations on the purchase of your Tru-Test EC-09 Platometer. This platometer is a high precision engineered device for measuring the average height of pasture relative to density of the pasture.

This is directly relative to the quantity of dry matter present (kilograms of dry matter – kg DM/ha).

Your platometer will become an invaluable tool in your farming operation for day-to-day feeding decisions and long term feed budgeting.

Safety note



Your platometer is designed only for measuring pastures. Do not use it for other purposes (e.g. it is not a walking stick).



Read and understand all the instructions before using the platometer. A copy of this user guide can be downloaded from livestock.tru-test.com



- Be careful around electric fences. Parts of the platometer will conduct electricity.
- Store the plate correctly.
- Be careful that the wind does not blow the plate away - it could be dangerous.
- It is not to be thrown!

Compliance

UK declaration of conformity



Hereby, Datamars declares that the equipment type EC-09-1 is in compliance with the relevant statutory requirements.

The full text of the declaration of conformity is available at the following internet address: <https://datamars.com/compliance>

UK Importer:

Datamars UK,
Pheasant Mill, Dunsdale Rd,
Selkirk TD7 5DZ, United Kingdom

EU declaration of conformity



Datamars Limited hereby declares that the EC-09 and EC-09-400 platometers are in compliance with the essential requirements and other relevant provisions of Directives 2014/31/EU, 2014/30/EU and 2011/65/EU. The declaration of conformity may be consulted at livestock.tru-test.com/en/compliance

EU Importer:

Datamars Slovakia s.r.o.
Dolné Hony 6, 949 01
Nitra, Slovak Republic

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EC-09 models available

The **Tru-Test EC-09 Platemeter** is available in two models, for different markets:

Model	EC-09	880 0002-097 (832842)
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The EC-09 Electronic Plate Counter automatically records each reading and displays values for number of samples taken, plus average pasture height and cover.

Different calculation formulas can be entered and selected, with the selected formula remaining in use until changed. All data and records are retained when the counter is switched off.

Model	EC-09-400	880 0002-659 (835153)
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EC-09 model, but extendible with a 400 mm grooved rod extension for use in tropical climates with longer grass to measure. Only available in regions suited to its use (e.g. Australia).

Recommended use of *Jenquip Pasture Management Desktop* software



Datamars recommends the use of *Jenquip Pasture Management Desktop* software. This software is required in order to download data from the platemeter. It takes the information from your farm walk and produces ready-to-use reports. *Jenquip Pasture Management Desktop* software is supplied with your platemeter on a USB stick.

For details, see page 21.

PC requirements

- Windows* 10 and above (recommended), operable with Windows* 7 and above.

Support, warranty and servicing

For warranty and servicing information, please visit:

livestock.tru-test.com/product-warranty

For all support, phone:

Country	Phone Support
New Zealand	0800 AGDATA (0800 243282)
Australia	1800 248 774



- Do not force or over-tighten the potentiometer. This may damage the platemeter and void the warranty.
- Water blasting or submerging the unit will void the warranty.
- When replacing the battery do not pull on the battery snap wires as these will become dislodged from the electronics, and will need to be repaired. This will void the warranty.

Service repair agent

All units to be returned for repair should be sent to:

New Zealand	Jenquip 8, Weld Street Feilding 4702, New Zealand	sales@nzagriworks.com
Australia	Industrial Technik Pty.Ltd. Warehouse 32, Blue Ribbon Industrial Park 23 Killafaddy Road, St.Leonards Tasmania 7250, Australia	admin@technik.com.au



To reduce bulk and cost of shipping it is recommended you remove the plate and retain and send the rest of the unit to your service agent.

Assembling the platemeter

The platemeter is supplied in parts:

1 - The plate

The heavy-duty plastic plate sits on top of the pasture to establish average height and density. The area of the circle and weight of the plate have been carefully calibrated.

2 - The rod and shaft with meter

The grooved rod allows pasture to be measured in 0.5 cm intervals (clicks). The yellow shaft includes the electronic meter.

3 - The handle

The black handle can be adjusted to suit the height of the user.

To assemble the platemeter:

- 1 With one hand, hold the yellow shaft vertically with the counter towards the ground. The grooved rod will slide down through the shaft.



- 2 With your other hand, screw on the plate, making sure that the smooth side of the plate is uppermost (ribbed side closest to the meter).



- 3 Turn the platemeter the correct way up (plate down) and place it on the ground. The grooved rod will protrude out of the shaft. With one hand hold the grooved rod and with the other hand, screw on the black plastic handle.



- 4 Use the buttons on the handle to adjust the handle so that it is a comfortable height.

4 - Assembling the grooved rod extension (EC-09-400 only)



These steps are only relevant to the **EC-09-400 platemeter**, intended for climates with longer tropical grasses.



Prefer to watch a video?

Search **How to assemble and calibrate a Tru-Test Platemeter** in our Tru-Test channel on YouTube*.

- 1 Screw the top handle (black in some models) into the grooved rod.
- 2 Turn the grooved rod upside down and slip off the O-ring.



- 3 Put four drops of thread locker into the female end.



- 4 Screw the threaded rod extension into the grooved rod and tighten firmly by hand.
Do not use tools as it may damage the grooved rod.
Wipe off any excess thread locker with a dry cloth.



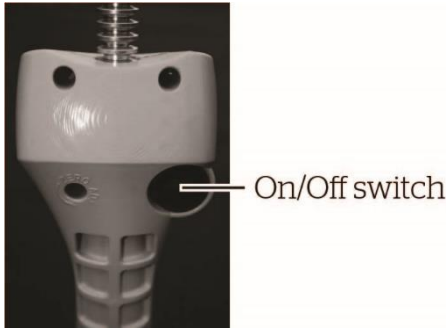
If you are using the extension, ensure that you 'zero calibrate' the platemeter before use!

For details refer to section *Testing to see if 'zero calibration' is required* just to make sure it is correct (see page 13).

Operating the platemeter

Switching the unit on and off

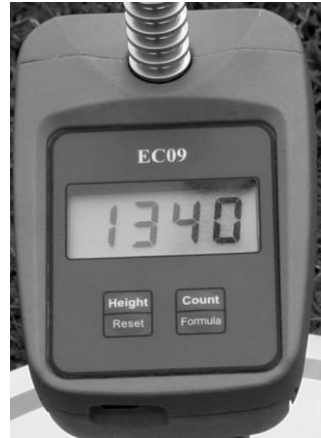
The platemeter is switched on and off using the black switch at the back of the unit. Off is in the 'down' position. When the unit is off, there are no numbers displayed on the LCD screen.



Front display buttons

The various functions of the platometer are accessed by the two buttons on the front of the unit, labelled 'Height/Reset' and 'Count/Formula'. The words in bold type are the primary functions.

These are activated by a short press of the button. The secondary functions 'Reset' and 'Formula' are activated by holding the button down until the function operates. When the unit is first switched on, the display will show the current formula in use and the calculated kg DM/ha based on that formula, and any readings in memory. Pressing the "Height" button will briefly display the average pasture height. This is often referred to as "clicks" (measured in 0.5 cm) and will be displayed to one decimal place (i.e. 0.0 or 12.4).



1 click = 0.5 cm.

The number of readings is displayed when the 'Count' button is pressed. The display will show a 'c' on the left side and the count on the right. The display will return to normal after two seconds.

All readings can be cleared (reset) by holding down the "Reset" button for approximately two seconds, then the display will change to "0".

Testing to see if ‘zero calibration’ is required

To ensure that the platemeter accurately measures the compressed height of pasture, the platemeter must be calibrated. This requires setting a base level of zero so measurements can be benchmarked against this.

If the counter does not return to zero after each reading (or “plonk”), it will not record the measurement - hence the counter will not beep!

If the counter is removed from the grooved rod or receives a severe knock it may jump to a groove on the steel shaft which will put the counter out of calibration. It will need to be recalibrated.

To recalibrate your EC-09 platemeter:

- 1 Ensure the plate is fully down (place on a firm flat surface) and the unit is switched off.
- 2 Hold the “Count” button while switching the unit on. The display will change to “CAL” briefly and display a colon (:) followed by a number. Let’s assume you see “.5” when you switch on.
- 3 The colon signifies that it is in fine calibration mode. Remove the protective rubber bung by levering it out gently using a flat-bladed screwdriver. Proceed as follows:
- 4 Using the flat bladed screwdriver, turn the steel shaft within the cog, anticlockwise, until the display reads “0”



The cog and steel shaft must remain stationary.



Do not turn the shaft beyond this point or you may damage the platemeter and void the warranty.



- 5 Once the counter reads zero, move the counter up the full length of the shaft. The colon will disappear once it passes 9 and enters "clicks" mode. At the full height the display should read approximately "50" which is 50 half centimetres. The platometer has now been calibrated successfully.
- 6 Switch off when you have finished, and then back on again without pressing any buttons.
- 7 Test the zero calibration by raising and lowering the plate all the way to the bottom several times. A beep should sound, and the kg DM/ha displayed as the plate falls. If it does not, repeat the steps above and retest.
- 8 When you have finished calibrating the platometer, replace the rubber bung over the zero adjustment screw.

If the calibration fails to hold, then the potentiometer, which the cog drives, is probably faulty and will need replacing. This can occur with excessive wear often compounded by dust and dirt entering the dry bearing of the potentiometer.

Start up/self test

1 Switch on

The platemeter will beep and display the current formula setting. The formula will be displayed next with the '+' part of the equation first (default 500) and then the 'x' part second (default 140).

2 The display will then show the kg DM/ha calculation based on that formula and any readings stored in memory.

3 To clear the readings, press and hold the 'Reset' button until the display shows '0.0'. There is one default plate equation, and one custom (user editable) equation. The former is built into the chip and cannot be replaced or modified. This equation is typically used between April and September in New Zealand.

During start up, if the battery charge is low it will display "Lo" and give two beeps. It will still work OK for some time. However, it would be a good idea to take a spare battery with you on the farm walk.

The original formulas developed for use with the platemeter were:

- Dairy Pasture (Reasonably consistent rainfall areas height reading x 158 + 1000 = Cover (kg DM/ha).
- Dairy Pasture (moderate rainfall periods height reading x 158 + 200 = Cover (kg DM/ha).
- Sheep pastures: height reading x 158 = Cover (kg DM/ha).

The platemeter also provides an option for selecting your own equation or those recommended by consultants, such as Dairy NZ or Beef + Lamb New Zealand. Your platemeter will be set up for the Dairy NZ recommended equation for the autumn/winter months.

Entering the factory default formula

While the platemeter is switched on, hold down the 'Formula' button. The display shows 'F_ _ d' Press the 'Reset' button briefly. The display will then show (500) and then (140). The default formula has now been loaded and saved to memory.

Other formulas

To better reflect the growth stages of pastures these formulas were derived:

Seasonal variations of formulas

- 1 Winter & early spring - before stem growth $x125 + 640$
- 2 Late spring & early summer - during stem growth $x130 + 990$
- 3 Mid summer $x165 + 1480$
- 4 Early autumn - before autumn rain $x159 + 1180$
- 5 Late autumn - after rain $x 157 + 970$

Dairy NZ formulas

Dairy NZ also developed these month-based formulas:

<u>Months (Southern hemisphere)</u>	<u>Platemeter equations (Dairy pastures)</u>
Winter (April/September)	Platemeter reading $x 140 + 500$ (factory default)
October	Platemeter reading $x 115 + 850$
November	Platemeter reading $x 120 + 1000$
December	Platemeter reading $x 140 + 1200$
January	Platemeter reading $x 140 + 1200$
February	Platemeter reading $x 185 + 1200$
March	Platemeter reading $x 170 + 1100$

Months (Northern hemisphere)	Platemeter equations (Dairy pastures)
Winter (October/March)	Platemeter reading x 140 + 500 (factory default)
April	Platemeter reading x 115 + 850
May	Platemeter reading x 120 + 1000
June	Platemeter reading x 140 + 1200
July	Platemeter reading x 140 + 1200
August	Platemeter reading x 185 + 1200
September	Platemeter reading x 170 + 1100



Some equations may change without notice and are influenced by seasonal differences. If you are unsure of the current equation contact your local Datamars consultant, see page 6.

Entering your own formula

To enter your own cover equation or one that may have been recommended by a third party, such as your consultant or Dairy NZ or Beef + Lamb NZ, please do the following:

- 1 While the platometer is switched on, hold down the "Formula" button. The display looks like this: "F--d". Press the formula button again briefly - then change the "d" (default) to "c" (custom). Now press "Reset" briefly and the display will look like this: "0---" This is the first of two numbers you will enter. The first number is the equation "add" number and the second the "multiply" number. For example, in equation 2 above, the first number (115) is the "multiply" number and the second (850) is the "add" number.
- 2 The "add" number is 4 digits long and can range from 0 to 9999. Starting with the first digit, press the "Formula" button to change this digit to a value from 0 to 9. Press the "reset" button when it is correct. Note that, 850 for example would be entered as (0850). Enter the next digit. Repeat this process until all 4 digits have been entered. The display then changes to the "multiply" number.
- 3 The "multiply" number has 3 digits and can range from 0 to 255. The first digit will appear. Press the "Formula" button to change this digit to a value of 0, 1, or 2. Press the "Reset" button when it is correct and the next digit will appear. Repeat this process until all digits are entered and the display returns to its normal state.

As manufacturers we can only give broad guidelines with regard to the formula to use. For advice on creating custom formulas optimised for your particular farm, and circumstances contact Datamars support, see page 6.

Using your platemeter

Principal of use

Place the platemeter squarely on the ground. The plate will “rise” as it rests on the grass, giving a reading of grass height ($\frac{1}{2}$ cm increments) on the bottom counter. At each measurement, click the top (sample) counter to record the total number of samples taken.

Technique

Practice the technique of an uninterrupted slow walking pace, taking care not to “roll” the platemeter. This is where the plate is not square to the ground, and it will provide a false HIGH reading.



Lowering the platemeter consistently rather than rolling it, will provide a more accurate reading.

Farm walk

The more regularly you take readings the better. Astute farmers will take readings weekly, sometimes more often during critical times of the year and less frequently during times of static conditions.

The more samples taken per paddock the less margin of error. We recommend 20 to 40 samples per paddock but if you have bad conditions ie. pugged paddocks, then more samples should be taken.

Most paddocks will have areas of good growth and areas of poor growth. If recently grazed, the pasture may be clumpy. Ensure that your walk includes representative samples of both areas. Avoid tracks, stock camp sites and other uncharacteristic areas.

Take samples every 3 paces or so, rather than choosing by eye the spot to sample. This removes operator preference for long or short patches.



Be consistent. Plan the same walk every time although it can be done in reverse. This allows each walk to be compared with another.

Taking paddock readings (the pasture walk)

The platometer can save recorded average height readings to a specific paddock number which can be selected on the platometer. Via the mini USB cable these readings can then be downloaded from the platometer and aligned with your paddocks in “walk order” which will need to be defined in the *Jenquip Pasture Management Desktop* software.

How to take paddock readings:

- 1 Switch the unit on via the on/off switch at the back of the platometer.
- 2 Reset by holding the ‘Reset’ button until the display changes to ‘0’. This should be accompanied by 2 short beeps.
- 3 Walk across the paddock taking readings every few paces. You will hear a beep every time a reading is stored. The average kg DM/ha is immediately recalculated and displayed. The number of samples (readings) to be taken should range between 20 and 40 per paddock however this will be determined by the variance existing in the cover. You will hear 3 short beeps when you have completed 29 readings and one long beep when you reach 30. This is the recommended number of readings. Readings need to be taken on a regular basis e.g. every three paces to even out any variations, however, avoid stock camp areas, tracks or uncharacteristic areas. The greater the variability, the greater the number of readings you should take.
- 4 If you need to negotiate an obstacle (e.g. fence or creek) switch the unit off so that no readings are taken if the plate moves. On the other side of the obstacle, switch the unit back on and continue taking readings.
- 5 When you have completed the paddock, read off the average pasture cover.
- 6 Write down the average height and/or the average cover.
- 7 Repeat instructions 4 to 8 until you have completed every paddock.
- 8 Switch the unit off using the toggle switch at the back.



Undo Feature: You can “undo” the last reading by holding down the “Height” button as you switch on the platometer. The count will now be one less than what it was and the dry matter reading will also change to the previous reading. You can continue taking more readings if you wish.

Results from feed budgeting will assist in making important management decisions such as:

- Stocking rates
- Quantity of feed supplements to feed
- When to apply nitrogen fertiliser
- Predicting future shortages or surpluses of pasture
- Planning silage and hay making
- Drying off times
- Stock sale decisions
- Highlighting poor performing pastures or paddocks

Software to use

Datamars recommends the use of *Jenquip Pasture Management Desktop* software. This software is required in order to download data from the platometer. It takes the information from your farm walk and produces ready-to-use reports. *Jenquip Pasture Management Desktop* software is supplied with your platometer on a USB stick.

Use the *Jenquip Pasture Management Desktop* software to further process the platometer readings and do your feed wedge:

Total Dry Matter = Kg Dry Matter per Hectare x Paddock Area

Growth Rate of Pasture

$$= \frac{\text{Final kg DM/ha} - \text{Initial kg DM/ha}}{\text{Number of days between samples}} \text{ (kg DM/ha/day)}$$

Maintenance after operation of your platemeter

Your platemeter has been developed over a number of years to be simple, effective and reliable. However, a little maintenance will ensure many years of trouble-free use from this platemeter.

Before use: After assembling the plate onto the counter, move the plate up and down a few times to ensure no binding occurs. If its movement is restricted the reason must be found and rectified before the meter is used.

-
- After use:**
- Remove the plate and wash it clean.
 - Wash / wipe and dry the area around the bottom of the meter.
 - Move the counter so that all dirt and accumulated grass can be washed away.
 - Store the platemeter in its folded position.



Do not use CRC or other lubricant/cleaner as this may bind the rod of the shaft to the slide tube and prevent use.



This is a precision instrument - look after it.
Water blasting or submerging the unit will void the warranty.

Replacing the battery

On start up if you get a “Lo” battery warning then the battery will need replacing over the next farm walk or two. A triangle icon in the top left hand corner also indicates a low battery. The platemeter is powered by a single 9 V battery. The use of an alkaline battery is recommended though a standard heavy duty battery will still work well. An alkaline battery should give 40-50 hours continuous use. A NiCad rechargeable battery may also be used.

Before you replace the battery, ensure that the platemeter is switched off. Remove the screw on the front of the platemeter. The battery retainer will slide out towards you.

Remove the battery and gently remove the battery snap connections (lever off with a screwdriver). Fitting the new battery is the reverse of the removal procedure. If your battery is near the end of its life, it is a good idea to carry a spare with you.

Instructions for disposal of product



This symbol on the product or its packaging indicates that this product (and its battery) must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you purchased the product.

This product is supplied with a standard non-rechargeable 9 V battery.

For instructions on how to dismantle this product for recycling, email service.dept@datamars.com

Fault finding

There is no visual display:

<u>Check</u>	<u>Resolution</u>
The platemeter is not turned on	Turn on
The battery is flat	Replace the battery
If you have just changed a battery, you may have damaged the battery snap clip to top of the battery.	Service: Send the platemeter to your service agent.

The platemeter continuously beeps and eventually turns off:

<u>Check</u>	<u>Resolution</u>
This is normally due to a low battery. The platemeter requires a given level of power to operate correctly. If the battery doesn't have sufficient power it may continuously beep to warn you.	Change the battery
Remember if you turn the platemeter off for a few minutes it may recover slightly but the problem will not go away.	Battery may be due for replacement. Requires electronic service.



Most problems are due to the platemeter being out of calibration (see following points as to why. If in doubt it is worth testing to see if 'zero calibration' is required, just to make sure it is correct (see page 13).

Check	Resolution
The cog has wound off.	Replace - Request a spare cog from your service agent.
Potentiometer damaged. The Potentiometer is the shaft part that drives the cog. NB: Under no circumstances should you apply CRC or a light oil to the potentiometer. It is a dry bearing, and any lubricant will render the potentiometer useless).	Send the platemeter to your service agent for repair.
Check the metal shaft is coming right back into the base of the tube. Ensure that there is no grass or soil build-up preventing it from doing so. Also check the washer at the bottom of the shaft is not catching on the bottom of the plate.	Clean the platemeter.

The platemeter does not "beep" when taking a reading:

This means that the platemeter does not know where the bottom is - therefore does not record the reading.

Readings do not seem accurate:

Check

The counter is like a calculator - it does not give false readings under normal circumstances.

Cover Equations

In New Zealand there are a number of standard equations published by various organisations. These reflect regional pasture types. If you wish to change an equation or select alternative species you will need to contact your consultant. Traditionally the equation of height X 158 plus 200 was used however there has been a series of equations produced to reflect changes in pasture types and physiological state (vegetative, flowering, seed head) which can alter DM levels in the paddock.

A more accurate calibration can be achieved by taking cuttings or your consultant may be able to advise you on the most appropriate equation for your situation. This particularly applies to pastures under irrigation.

Resolution

Check the equation being used is correct and the calibration has been correctly set. (Zeroed).

Check what equation you are using.

Platemeter not running freely (low results):

Check	Resolution
Metal shaft is bent.	Straighten or request a replacement part from your service agent.
Grass or soil build-up inside case.	Clean the platemeter.
Flutes on steel shaft have become filled with grass or soil.	Clean the platemeter.

Front panel (membrane) problems:

Check	Resolution
Buttons not clicking or activating.	Service - membrane needs replacing. Send the platemeter to your service agent.

How do I change a formula?

Check	Resolution
The platemeter is switched on. If you wish to select the inbuilt default formula.	Hold down the 'Formula' button until the display changes to 'F__d'. While the 'd' is displayed, press the 'Reset' button. The following equation is used: $\text{Cover (kg DM/ha)} = 140 \times \text{height} + 500$

Notes: