Handbook
EC10 Platemeter

Made by JENQUIP
First in the Field

Jenquip Pasture Management Software is supplied with your platemeter on a USB stick.

Contents

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Introduction

Congratulations on the purchase of your EC10 Platemeter. This platemeter is a highly engineered precision 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 platemeter will become an invaluable tool in your farming operation for day-to-day feeding decisions and long term feed budgeting.

Important safety note

Read and understand all the instructions before using the platemeter. A copy of this user guide can be downloaded from www.jenquip.co.nz or www.nzagriworks.co.nz

Your platemeter is designed only for measuring pastures. Use it for no other purpose (e.g. it is not a walking stick.) This platemeter has been manufactured using quality materials and techniques, however, if faults do occur, have them corrected before you use the platemeter.

Be careful around electric fences. Parts of the platemeter will conduct electricity!

Store the plate correctly. Be careful that the wind does not blow the plate away. It is not to be thrown.

Water blasting or submerging the unit will void the warranty.

Assembly Instructions

The platemeter is supplied in three parts:

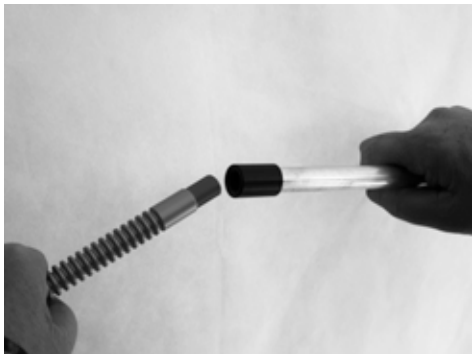
The plate
The plate sits on top of the pasture to establish average height and density. The area-to-weight ratio of the plate has been carefully calibrated.

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

The handle
Attach top handle to the rod. Ensure that the rod does not fall through the counter as this will damage the gear and void warranty.

Handle assembly instructions

Screw top handle onto the top of the grooved rod where it comes out of the counter.

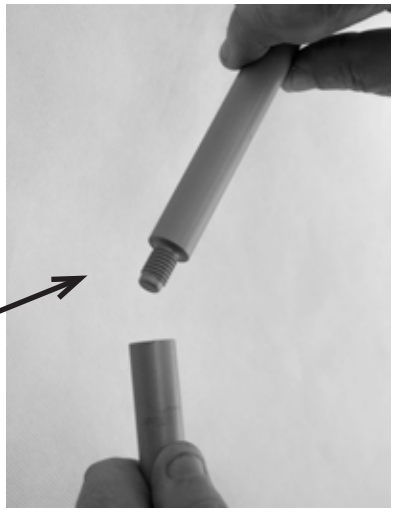


Grooved Rod Extension (for the 400mm model)

Turn upside down and slip off the O ring.

Put 4 drops of thread locker into the female end.

Screw threaded rod extension into grooved rod and do up firmly by hand, wiping off any excess thread locker that may have leaked out with a dry cloth. Do not use tools as this will damage the grooved rod. ***Refer to the handbook for zero calibration before use.***



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.

EC10

Front display buttons

The functions of the EC10 are defined by the four buttons on the front of the unit.

The words in BOLD type (see below) are the primary functions. Activate by pressing the button briefly. Activate the secondary functions (in normal type, see below) by holding the button down until the function operates.

Disp/Enter

Height/Reset

Count/Menu

Up/down arrows

Press Display to show the current paddock number selected (1-100)

Press Enter to show the current paddock number selected (1-100)

Up/Down arrows used to scroll back and forth in some options

When the Count button is pressed the number of readings is displayed. A "C" will show on the left side and count on the right. Hold the button down to view menu of further options.

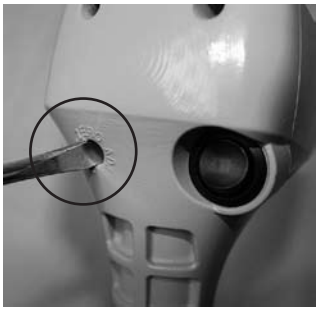
Height displays the average height of readings in clicks (0.5cm). Pressing Reset will save the average height to memory and reset all data ready for the next paddock.

Zero Calibration

To ensure that the platemeter accurately measures the compressed height of the pasture the platemeter must be calibrated. This requires setting a base level of zero so that measurements can be benchmarked against this. If the counter does not return to zero after each “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 a groove on the steel shaft which will put the counter out of calibration. It will need to be recalibrated.

To do this, work through the following steps:

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. Proceed as follows:
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. Use a flat bladed screwdriver and turn the plastic or steel shaft within the cog anti clockwise, until the display reads “0”.
   NB: the cog and steel shaft must remain stationary. DO NOT TURN THE SHAFT BEYOND THIS POINT OR YOU MAY DAMAGE THE POTENTIOMETER. Once the counter reads zero, move the counter up the full length of the shaft. The colon will disappear once it passes 9 and enter “clicks” mode. At the full height the display should read approximately “50” which is 50 half centimetres. The counter has now been calibrated successfully.



4. Switch off when you have finished, and then back on again without pressing any buttons.
5. Test the zero calibration by raising and lowering the plate several times. A beep should sound and the kgDM/ha displayed as the plate falls. If it does not, repeat the steps above and retest.

If calibration fails to hold, then the potentiometer, which the cog drives, may be damaged 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

Switch the unit on. It will beep and show “EC10” in the display panel. If the battery needs recharging it will beep 3 times and “lo” will display on the panel. The current formula in use will be displayed next with the “+” part of the equation first (default 500) and then the “x” part second (default 140).

The kgDM/ha calculation will be displayed based on that formula and any other readings stored in the memory.

To clear the readings, press and hold the Reset button until the display shows 0.0

The unit has one default plate equation (built into the chip and cannot be replaced or edited) and one custom (user editable) equation. This equation is typically used in New Zealand between April and September.

- 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. Your platemeter will be set up for the Dairy NZ recommended equation for autumn/winter months.

Entering the Factory Default Formula

While the EC10 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.
To enter your own formula refer to page 10 “Entering your own formula”.

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

DEXCEL also developed these month based formulas:

Months (Southern Hemisphere)	Platemeter Equations Dairy Pastures
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 consultant.

Entering your own formula for displaying available covers: changes to the EC10

Displays “Available” cover required in some markets.

All the current features of the EC10 are still there and function in exactly the same way.

There is now an extra option in the menu called “A---”
This is to allow the user to input a number that the platemeter will treat as a negative number.

The procedure for entering a number here is done in the same way you would enter a custom formula (same buttons pressed.)

For example: if the current formula was (h x 140) + 500 and the negative number entered was 1,000, then the new formula would be: “available cover” in kg = (h x 140) + 500 – 1000”

Where “h” equals the average height recorded by the platemeter.

Each model will leave the factory with the “A---” set at “0000”
This means that the EC10 will function straight out of the box exactly as they do now and this feature will have no effect, unless activated.

When the platemeter is switched on, it will display the default setting of:
140
500
0.0.0.0 (The decimal points will flash 3 times indicating a negative, of any number the user has entered and saved.)
Any changes to the formula will be retained and displayed next time the platemeter is switched on.

When the platemeter is used with a negative number activated and the result in kg of dry matter is < “0”, then the LCD will display “0000”. The platemeter will still beep with each plonk and continue to count. The hyphens will flash on and off with each beep. An “Actual” negative number cannot be displayed.

A positive number result after calculation will still show as a positive number as normal.

Examples:
Assume the formula used is (h x 140) + 500 – 1000

If the average “h” (height) = 4.0 then:
(4 x 140) + 500 – 1000 would result in a display of “60” kg

Any negative number entered by the user is saved to memory and ready to use next time. If, in the menu the “F-- d” option is selected, then all settings are reset to 140, 500, 0000

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 Dexcel or Meat & Wool, do the following:

1. While the EC10 is switched on hold down the “MENU” button. The display reads: “F--d”. Press the UP arrow once to change the “d” (default to “c” (custom). Press “Enter” and the display will show the first figure of the current “add” equation and may 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. e.g. in the equation above, the number (115) is the “multiply” number and (850) is the “add” number.

2. The “add” number is 4 digits long and can range from 0- 9999. This must be entered first. Starting with the first digit, press the “Up” arrow to change this digit to a value from 0- 9. Press the “Enter” button when this is correct. Repeat the process until all four digits have been entered. The display then changes to the “multiply” number, which has only 3 figures.

3. The “multiply” number can range from 0- 199. The first digit will appear as 0 or 1. Press the “Up” arrow button to change this digit to the desired value from 0- 9. Press the “Enter” button when it is correct. (850 for example would be entered as 0850.) The next digit displayed will be whatever figure is part of the old formula. Use the “Up” arrow to change it, or just press “Enter” if it is correct. Repeat this process until all 4 digits have been entered. The display then changes to the “multiply” number, which has only 3 figures.

4. The “multiply” number can range from 0- 199. The first digit will appear as 0 or 1. Press the “Up” arrow button to change this digit to the desired value of 0 or 1. Press the “Enter” button when it is correct and the next digit will appear. The last two digits can have values from 0- 9. Repeat this process until all digits are entered and press the “Enter” button for the display to return to its normal state. Your new formula is now active and saved to memory.

As manufacturers we can only give broad guidelines with regard to the formula to use.

Using your platemeter

Technique

Practice the technique of an uninterrupted slow walking pace, taking care not to "roll" the meter. (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.

Farmwalk

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 i.e. pugged paddocks, 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 EC10 can save recorded average height readings to a specific paddock number which can be selected on the EC10. These readings can then be downloaded via the mini USB cable from the EC10 and aligned with your paddocks in "walk order"

How to take paddock readings:

1. Switch the unit on via the on/off switch at the back of the counter.

2. If starting the first paddock ensure the EC10 does not contain any old data. Press and hold the “Reset” button until display changes to 0. (There will be two short beeps.) Press and hold the “Menu” button. Press the arrow button twice until “P CL” appears (paddock clear). Press “Enter”. All recorded paddock data will be set to 0.

3. Press and hold the “Enter” button. You will see “E_ _ 1.” Scroll the numbers upwards using the arrow button. If you want to scroll back, hold the “Count” button while briefly pressing the “Arrow” button. The screen will go blank. The arrow (on its own) will scroll the numbers backwards. Press “Enter” at the paddock number you want to record. The paddock number will now be set. Check any time by pressing “Disp”.

4. Walk across the paddock taking readings every few paces. Every time a reading is stored a beep will sound. The kg/DM/ha is immediately recalculated and displayed. Depending on the variance existing in the cover, the number of samples- or “plonks”- taken should range between 20 and 40 per paddock. There will be 3 short beeps after completion of 29 plonks, and one long beep at 30 plonks. This is recommended as the minimum number of readings to be taken. Plonks should be taken on a regular basis - say every five paces- to even out any variations. Avoid stockcamp areas, tracks or uncharacteristic areas. The greater the variability of your paddocks, the higher number of plonks you should take.

5. Switch the unit off whilst negotiating obstacles- fences or creeks so that no readings are taken if the plate moves. (All data recorded so far is saved.) Once on the other side of the obstacle switch the unit back on and continue taking readings. UNDO feature: If you make a mistake while taking readings turn the unit off and hold down the reset button as you turn it back on. The word “UNDO” will display in the LCD window and the previous DM/kg reading will be displayed. The count will also be one less. Carry on taking readings from this point.

6. Once the paddock walk is completed hold the “Reset” button. The Average height of the paddocks will display first, which is then saved to memory under that paddock number. A small triangle icon will appear in the top left hand corner indicating that paddock now contains data. The EC10 will also be reset to zero ready for the next paddock.

7. Repeat steps 3 to 6 until all the paddocks are complete.

8. Saved paddock data and paddock numbers can be viewed at any time by pressing the arrow key. The display will first show the paddock number and the average height that was recorded. Pressing the arrow key again will show the next paddock with data in it. Once the last recorded paddock is displayed the EC10 will beep and return to the normal display.

You can escape the paddock display function at any time by pressing “Disp”.

How to take paddock readings- step by step instructions

Press & hold “reset” button to clear any old data

Press & hold the “menu” button

Press the arrow button twice until p cl (paddock clear) shows on the display

Press “enter” and all data will be deleted

Press & hold the “enter” button. E _ _ 1 will show on the display

Press the arrow button to scroll upwards

To scroll backwards hold the “count” button and briefly press the arrow button

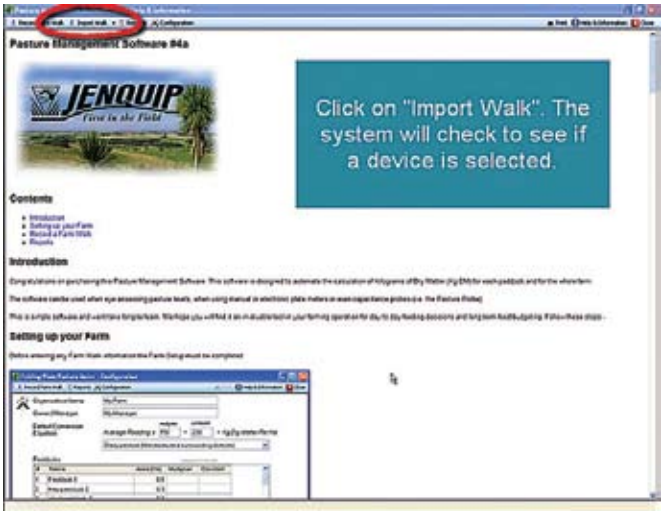
To select the paddock press “enter”

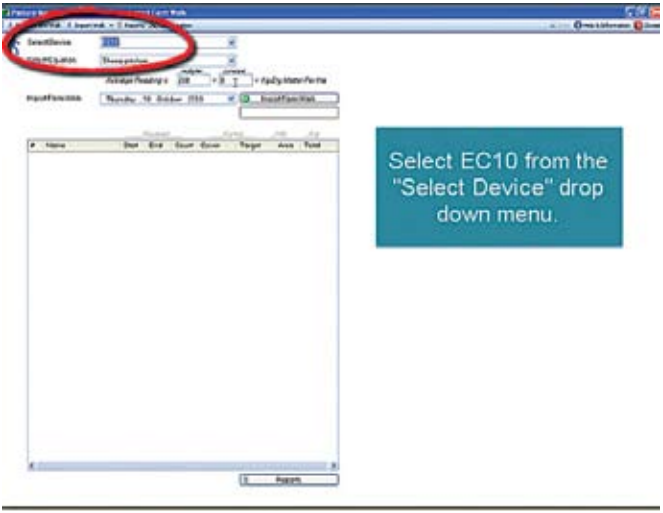
start “plonking”

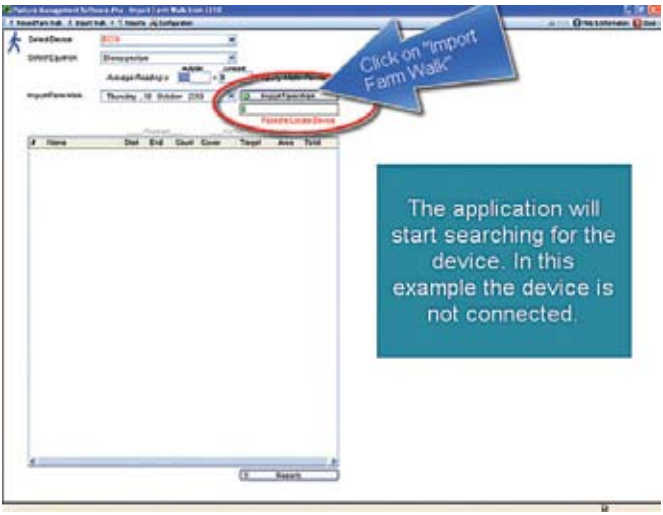
To save the data hold the “reset” button. An arrow will show up on the top left corner indicating that the paddock has data stored in it

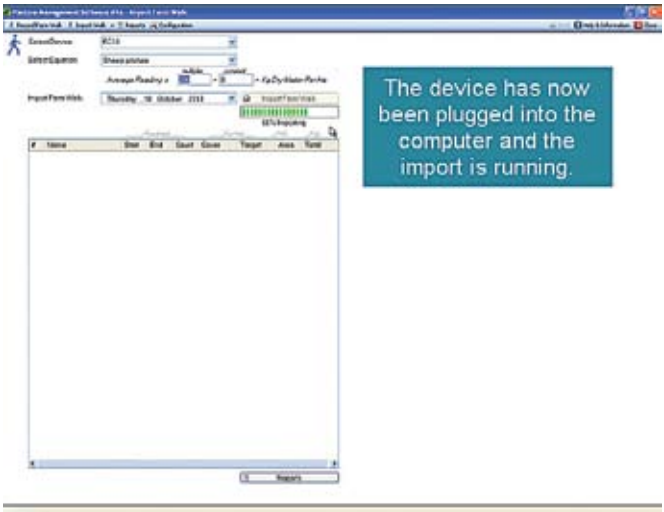
Instructions for downloading your platemeter software

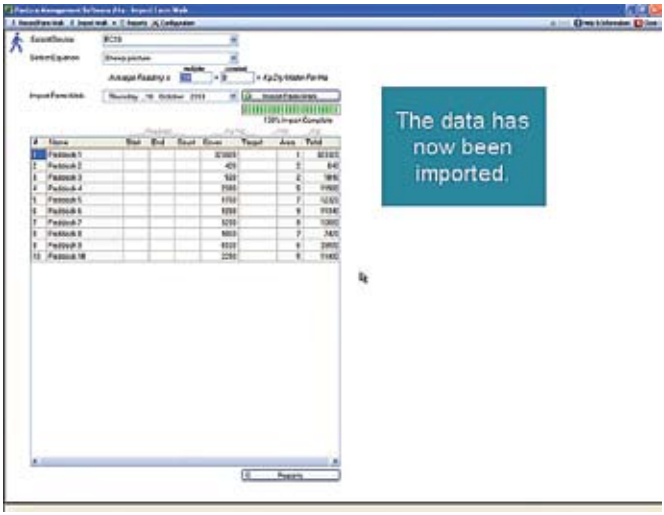
Load software onto computer.
Connect USB cable to computer and to the EC10. Attach cable to counter.

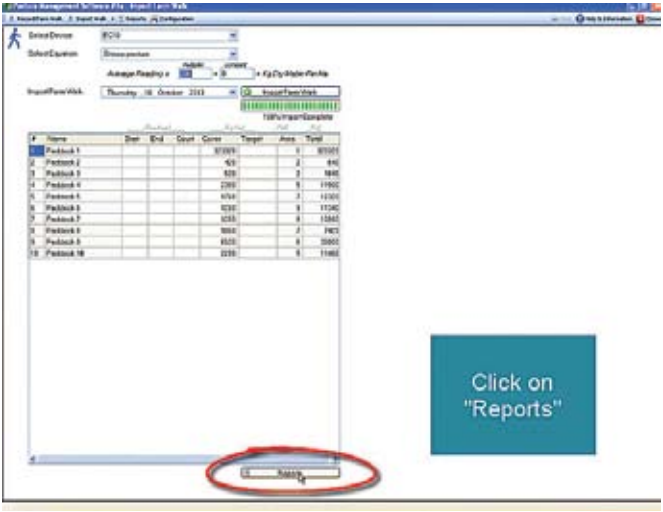


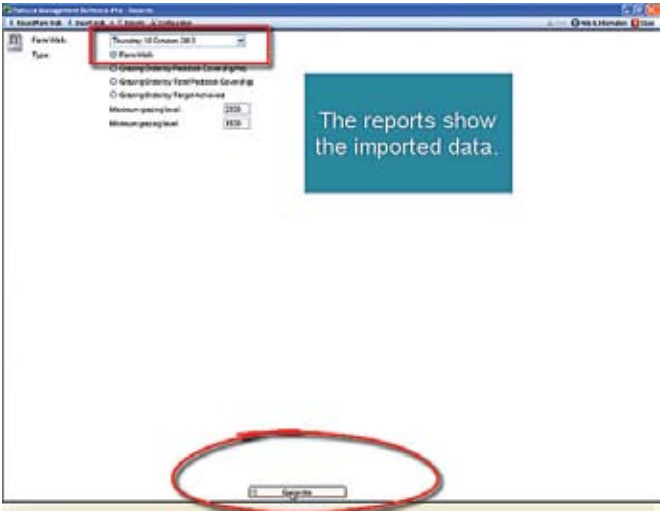

Select EC10 from the "Select Device" drop down menu.


Click on "Import Farm Walk"
The application will start searching for the device. In this example the device is not connected.


The device has now been plugged into the computer and the import is running.


The data has now been imported.


Click on
"Reports"


The reports show
the imported data.

Software

The Jenquip Pasture Management Software provided can be used, however this is only suitable for single farms. Jenquip recommends for multiple farm users the use of the Android App which can be purchased separately. It takes the information from your farm walk and produces ready-to-use reports.
The App can be found by looking up "Pasture App" in the Play Store for a 7 day free trial.

Jenquip Pasture Management Software is supplied with your platemeter on a USB stick, and does not require registration.

Use the Jenquip Pasture Management software to further process the platemeter readings and do your feed wedge.

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

Growth Rate of Pasture

= Final Kg DM / Ha- Initial Kg DM/Ha (KgDM/Ha /day)
Number of days between samples

Maintenance

Your meter 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.

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. Do NOT waterblast.
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.

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 electronic counter is powered by a single 9V 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 the counter is switched off. Remove the screw on the front of the counter. The battery retainer will slide out towards you.

Do not pull on the battery snap wires as these will become dislodged from the electronics and will need to be sent in for repair. This will void the warranty.

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.

Fault finding

There is no visual display

Check	Resolution
	Replace the battery
If you have just changed a battery you may have damaged the battery snap clip that attaches to the top of the battery.	Service: Send to your service agent.

The counter continuously beeps and eventually turns off

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

NOTE: Most problems are due to the counter being out of calibration (see following points as to why.) If in doubt it is worth Zero Calibrating just to make sure it is correct (see page 5)

The counter does not beep when taking a reading.

Check	Resolution
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 to your service agent for repair.

Check	Resolution
Check the metal shaft is coming right back into the base of the tube. Ensure 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
Check This means that the platemeter does not know where the bottom is – therefore does not record the reading.	Refer to page 5 “Zero calibration”

Counter readings do not seem accurate

Check	Resolution
The counter is like a calculator- it does not give false readings under normal circumstances.	Check the equation being used is correct and the calibration has been correctly set. (Zeroed)

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
Grooves 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 to your service agent.

How do I change a formula?

Check
The platemeter is switched on. If you wish to select the inbuilt default formula

Resolution
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:
Cover (kg DM/ha) = 140 x height +500

Returning for service

Remove plate and handle or extra freight charges will result. Leave the counter on the grooved rod.