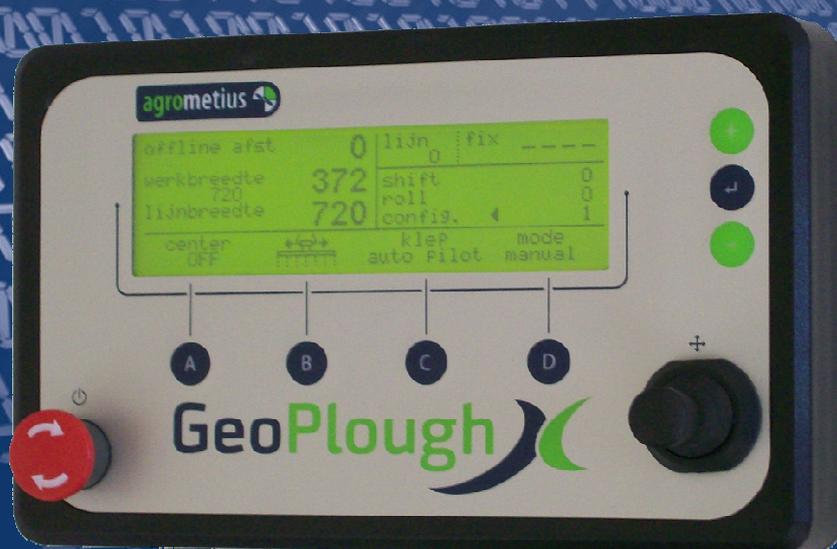


GeoPlough



User Guide

sw1.33

Foreword.

Read this manual carefully before operating the plough control.
Assure yourself that the plough control is installed well by experienced qualified personnel.

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Warnings.

- The use of plough control can lead to excessive wear of the plough.
- Never transport a plough on public roads with the plough control enabled.
- Remain outside the plough it's adjustment range when the tractor engine is.
- Move adjust the plough manually or automatically when the tractor is standing still and the plough is in or on the ground
- Keep the control panel always free from water and moisture.

Control monitor.



1.  **ON / OFF switch.**

2.  **Joystick for manual operation and (dis)engaging automatic mode.**

Operation for plough control:

 wider
smaller

 auto / manual mode

Operation for side shift:

 left
 rights

 auto / manual mode

Used the joystick to engage the automatic control (auto mode) or the manual control (manual mode). If the tractor chanches swath line while working in automatic mode the system will go in stand-by. Stand-by returns to automatic as soon as the tractor goes back to the original swath line. When system is connected to the lift command, it can automatically (dis)engage the automatic mode.

A. (Auto) Centering ON/OFF

When pressing A in the **manual mode** the implement will center (a plough goes to set working width, side shift will center).

When pressing A in the **auto mode** the Autocenter-mode will become active. When the working mode changes from **auto** to **manual** the implement will be automatically centered.

Centering can be stopped by pressing A again.

B. Operation direction

You can change the operation direction by pressing button B. The operation direction is displayed with an icon.

The possible operation directions depend on the operation type.

Operation Type	Operation Direction
Reversible plough	Current swath line plough to the left or right
conventional plough	Plough always to the left or right
Side shift	No choice

C. Swap Valve control

When the Autopilot manifold can control the plough or side shift through a swap valve, then this swap valve is engaged with button C.

D. AUXILAIRY ON/OFF..

Used to start or stop the auto mode switching with the tractor lift when it is connected to the lift command.



. Enter button

Press to go the the next or previous menu or to enter changed values.



. plus button

Press to scroll up or increase values.



. min button

Press to scroll down or decrease values.

Work screen



The work screen has 4 user levels: basic, advanced, expert and diagnose.

In *basic* you see :

- offline distance
- line number
- fixed line number

- swath width
- configuration

In *advanced* you see :-

- offline distance
- line number
- fixed line number
- actual working width

- swath width
- configuration

In *expert* you see :

- offline distance
- line number
- fixed line number
- actual working width
- shift

- roll
- swath width
- configuration

In *diagnose* you see :-

- offline distance
- line number
- fixed line number
- actual working width
- shift

- desired working width
- roll
- swath width
- configuration

The cursor ◀ can scroll up and down between shift, roll and config. With ↵ enter you get into the configuration menu or you can change the roll or shift.

With *Shift* you can move the line (offline distance increase or decrease) to compensate the plough working wider in heavier soil condition. This way the tractor offline distance remains around zero.

With *Roll* you can compensated for roll errors without having to change the tractor calibration so the plough works evenly wide back and forth.

Guidelines for correct operation.

First adjust the plough correctly for the desired working width while ploughing with the plough control disengaged. Variation of the plough width influences the plough adjustment. When the plough is adjusted correctly, you set the desired plough width in calibration menu 1.. Make sure you also have entered the correct swath width in the Auto-Pilot Display.

Drive the tractor in the furrow and shift the AB line to “to here” your current position so you can start with an off-line distance of 0cm. For this it is important that the tractor stands straight in the furrow.

Switch the plough control in automatic and the plough has to go to the desired working width.

Check if the plough direction switch stands OK by driving backwards away from the swath line and see if the plough width adjusts correctly. If not, toggle the plough direction switch the other way.

If all is set correctly you can start ploughing.

On the other headland you disengage from automatic mode before lifting and turning the plough. Otherwise the plough control keeps correcting during the turn on the headland and you end up in Stand By when standing in the next furrow.

The plough will always plough slightly different than the theoretic width due to soil variation resulting in a small offline distance. This offline distance has to be stable between sequential working passes.

return	Return to work screen	
implement	Implement	1, 2, 3 of 4
	type	reversible, conventional side shift
calibration	Furrow width	Desired plough width in millimeters (per furrow). Dependent the working width. Adjustable between 200 and 600mm.
	Adjust width (range)	Allowed adjusting range. Maximum admitted adjusting width per furrow in millimeters in automatic mode. Adjustable from 1 to 400. For example, a value of 100 mm will allow the plough to go up to 100 mm narrower or wider per furrow, if necessary. For larger off-line distances you will need more passes to straighten the furrow but the ploughed soil will be more even.
	Number of furrows	Dependent of the plough.
	Minimum width	Minimum furrow width in millimeters. Set the plough at its minimum width and measure the working width of the individual ploughshares. When measuring large variation in the width between the shares, take the average. Adjustable between 200 and 600.
	Minimum sensor	Set the plough at the minimum width entered at the previous calibration step minimum width. In the display you can see the voltage of the potentiometer.
	Maximum sensor	Set the plough at the maximum width to be entered at the

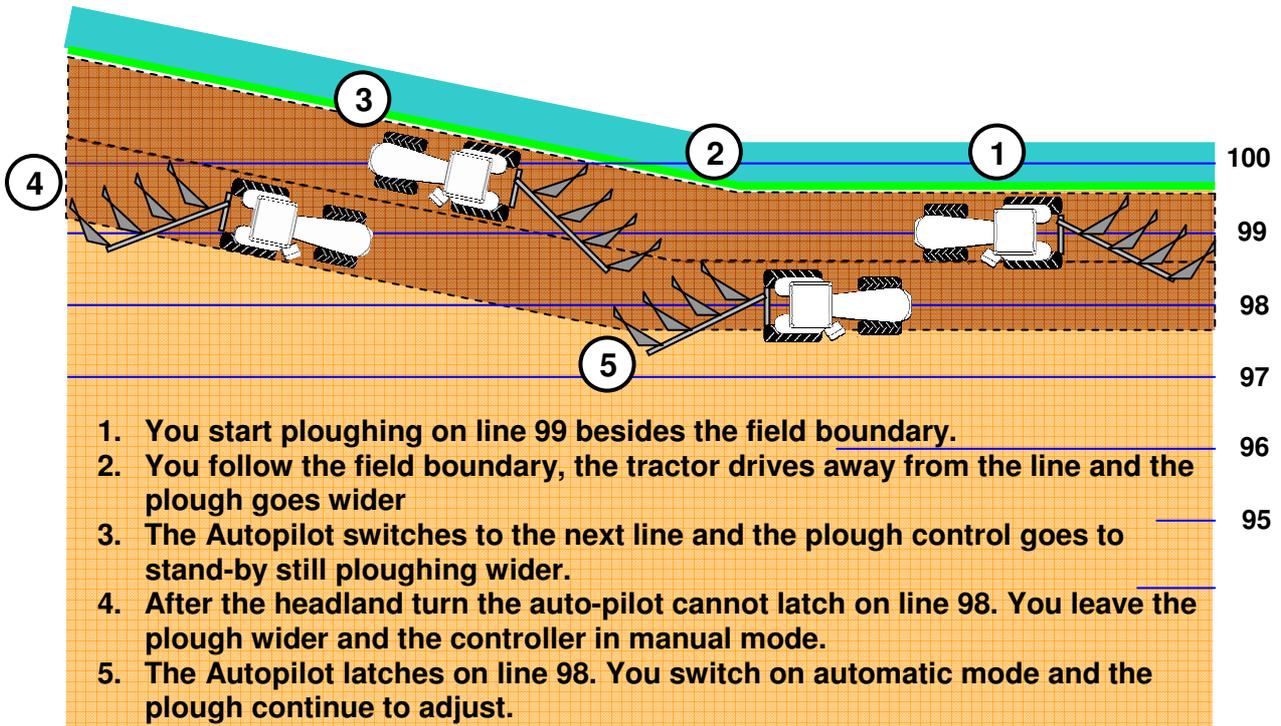
		<p>next calibration step maximum width.</p> <p>In the display you can see the voltage of the potentiometer.</p>
	Maximum width	<p>Maximum furrow width in millimetres.</p> <p>Set the plough at its maximum width and measure the working width of the individual ploughshares. When measuring large variation in the width between the shares, take the average.</p> <p>Adjustable between 200 and 600.</p>
	PWM wider	<p>Adjustable between 0 and 100%</p> <p>Choose the value as low as possible but the plough must still be able to widen in a normal way. It should take around 10-12 seconds going from minimum to maximum width.</p>
	PWM smaller	<p>Adjustable between 0 and 100%</p> <p>Choose the value as low as possible but the plough must still be able to narrower in a normal way. It should take around 10-12 seconds going from maximum to minimum width.</p>
	Stop dead zone	<p>Number of millimetres before the desired width is the achieved at which the controller stops adjusting.</p> <p>By default 10. Adjustable between 10 and 100.</p> <p>Only raise the value with a slow responding hydraulic valve or one that gives too much oil and therefore over compensates.</p> <p>The stop Dead Zone must always be smaller than the Start Dead zone</p>
	Start dead zone	<p>Number of millimetres that the actual plough width may differ from the desired width before the controller starts adjusting. By default 20 for a 4 furrow plough. Adjustable between 10 and 100.</p> <p>With larger ploughs the value probably needs to be raised to achieve stable control.</p> <p>The stop Dead Zone must always be larger than the Start Dead zone</p>
	1ste furrow	<p>Many plough are not 100% variable. The 1st share is too close to pivot point of the plough frame. Measure the distance between the pivot points of the 1^{ste} and 2^{de} share and the distance between the pivot points of the 1^{ste} share and the pivot point of the plough frame. Divide the distance between the pivot point of the 1^{ste} share and the pivot point of the plough frame by the distance between the pivot points of the 1^{ste} and 2^{de} share. Multiple the result by 100. Now you have the Relative range of the 1st share in a percentage.</p> <p>For full vario-ploughs always leave the value at 100.</p>
	Sensor offset	<p>Set the plough width in the middle of the range. The calculated furrowwidth is shown by the display. Measure the real furrow width and enter the difference width the</p>

		calculated value
screen	User level	Basic: only offline distance Advanced: offline distance and actual working width Expert: Advanced and Roll and Shift correction Diagnose: Expert and target working width
	language	Nederlands, English, etc.
	liftsensor	Pulse, state high, state low Choose the correct signal type when there is a liftsensor connected for remote engage
	aux input	Analog (V+), Digital (gnd) Choose the correct connection type when there is a liftsensor connected for remote engage
	autopilotscreen	FMD, FmX
diagnose		
test		

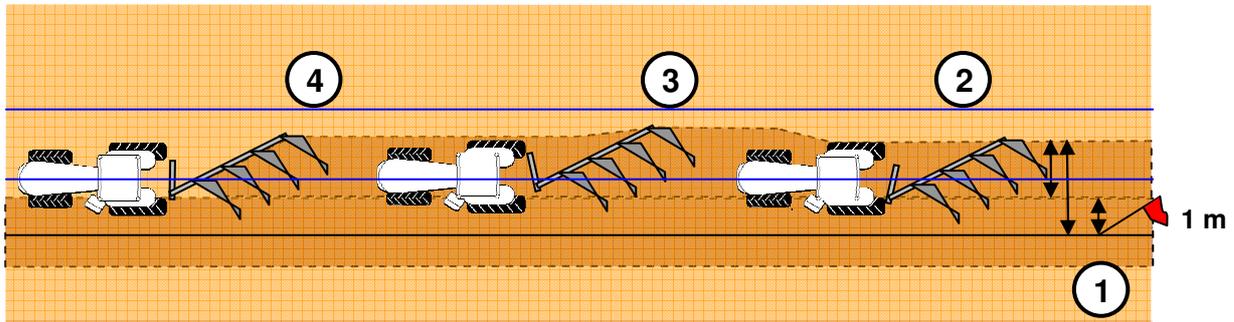
Notes

Calibration	Plough 1	Plough 2	Plough 3	Plough 4
Furrow width				
Adjust width (range)				
Number of furrows				
Minimum width				
Minimum sensor				
Maximum sensor				
Maximum width				
PWM wider				
PWM smaller				
Stop dead zone				
Start dead zone				
1ste furrow				
Sensor offset				

Ploughing wedges.



Calibration of a plough control on draught point adjustment.



1. To determine the plough width set a flag/pole 1m away from the furrow. Plough past the flag/pole and measure the distance from the flag/pole to the new furrow. Subtract 1m and you have the plough width.
2. Set the draught adjustment to the minimum (acceptable), plough a few meters and determine the plough width. Subtract the furrow width of the second to the last furrow and you have the minimum furrow width (of the first furrow). Set the Calibration *number of shares* on 1, and calibrate the *minimum plough width* and the *minimum sensor position*.
3. Set the draught adjustment to the maximum (acceptable) , plough a few meters and determine the plough width. Subtract the furrow width of the second to the last furrow and you have the maximum furrow width (of the first furrow).. Calibrate the *maximum plough width* and the *maximum sensor position*.
4. Sensor offset calibration (optional = difficult to determine). Set the *sensor offset* calibration on "0". Set the *Desired plough width* in the middle of the range. Skip the Autopilot swath line "to here" so the offline distance is "0" and switch of the automatic control as soon as the plough is adjusted. Plough a few meters and determine the plough width. Subtract the furrow width of the second to the last furrow and you have the actual furrow width. Enter the millimeters that the actual furrow width is bigger than the desired furrow width in the *sensor offset* calibration.

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Notes:

