

## Field Reference Guide—pH Manager

Keep with pH System and refer to daily.

(Refer to Operating Instruction Manual for complete instructions)

### PRIOR TO MAPPING: PERFORM ROUTINE DAILY MAINTENANCE

1. Inspect unit for loose or missing bolts, other obvious problems
2. Are sampling shoe and trough completely clean of soil?

3. In Manual Mode test each function (washing, raising and lowering):



Power switch must be on to operate any function

Manual-Auto switch: must be in Automatic mode for mapping; in Manual mode for manual control of washing or sampler shoe position

Sampler up and down: raises sampler shoe manually

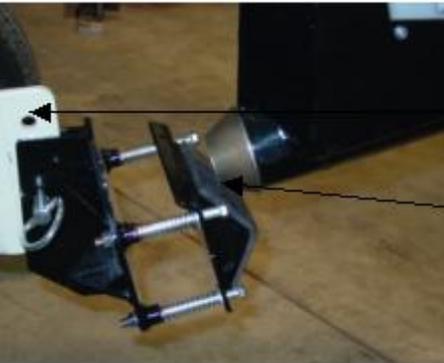
MANUAL CONTROLS:

Wash: On when washing manually; Off for Automatic washing

**WARNING**

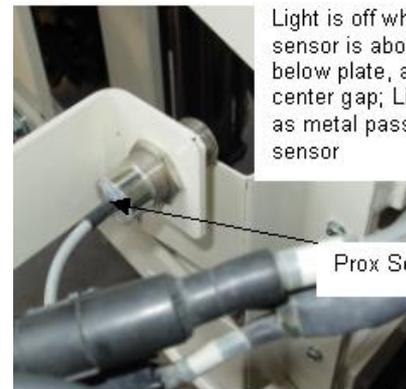
**Pinch point hazard**

4. Raise and lower sampling shoe—check scraper for appropriate contact:

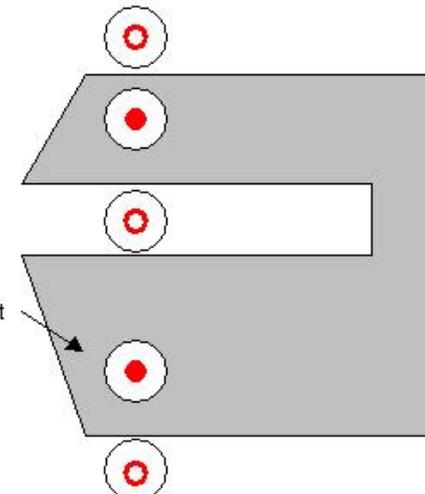


Adjust scraper bracket until cutting shoe clears scraper when sampler assembly is raised completely.

5. Inspect prox sensor light during manual cycling:

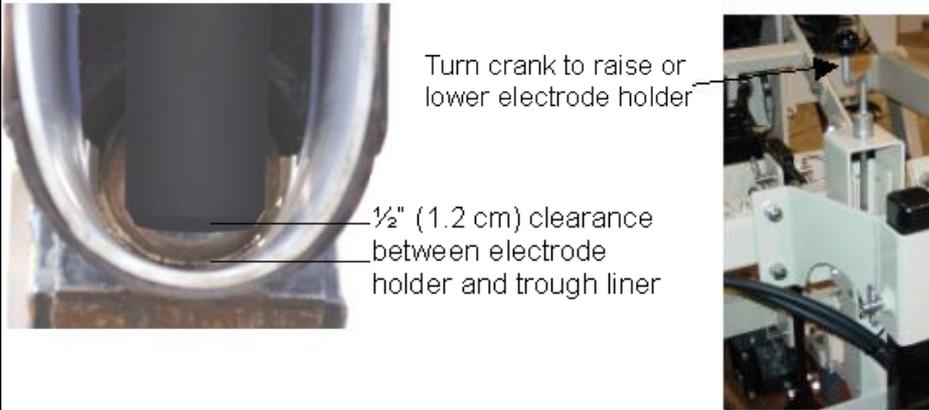


Light is off when sensor is above and below plate, and over center gap; Light is on as metal passes by sensor

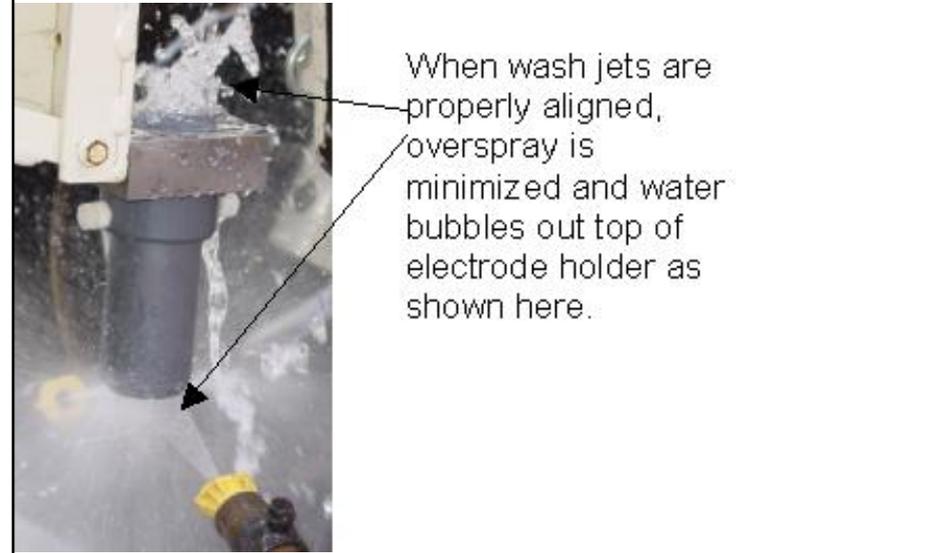


Adjust hydraulic flow so cycling time is 1.5-2 seconds

6. Raise sampling shoe—check for ¼” to ½” clearance between electrodes and trough; make sure this is where the shoe will stop in automatic mode (see prox sensor adjustment section in Operating Instructions)



7. Operate wash jets and check alignment; does water bubble out of top when electrodes are removed?



8. Raise unit and drive slowly in semi-circle with unit cycling to check automated functions



9. Calibrate electrodes

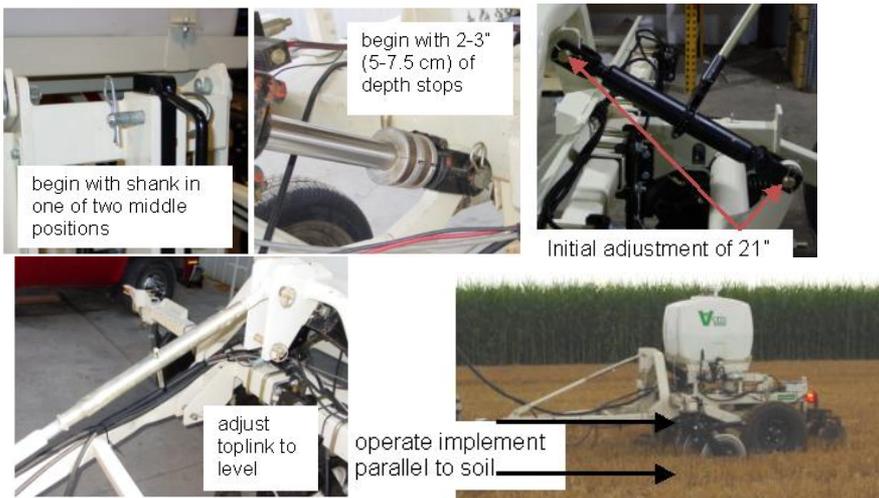
Insert electrodes into holder and finger-tighten set screws. Follow menu prompts to “pH Setup”. The instrument will prompt for the electrodes to be inserted into pH buffer 4 solution; Slide pH 4 buffer solution container onto electrode holder. Press 1 to continue with calibration or 2 to exit. Repeat with pH 7 buffer solution.



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1)Data Acquisition      Insert electrode 1)Cont
2)PH setup             into pH4 solution 2)Exit
4)EXIT
1)Calibrate ISE's
2)Controller setup 4)EXT
Cal 1)4.0 1)Accept
pH4 2)4.2 2)Redo 3)Ext
    
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10. Set operating depth: 2-3" of cylinder stops (21" length of ratchet, machine level, sampler shank in 2<sup>nd</sup> or 3<sup>rd</sup> hole typically).



11. Cycle unit in soil at desired field speed (4-8 mph) and inspect sampler shoe for core. Slow down if full core was not retained.



## DATA QUALITY TIPS

**-All pH mapping requires calibration samples to be collected from the field.**

**-Before logging any data, make sure the SD card in the Datalogger is clear of any files that are not Veris .dat files.**

-During 'Cycling' phase, *do both pH electrode readings get close to the wash water pH?* If not, one or both electrodes may not be cleaning properly.

-During 'Recording' phase, *do both electrode readings move to expected soil pH level?* If they stay near wash pH level and/or require more than 10 seconds to settle, one of the following may have occurred: 1) shoe may have plugged, so no new soil is entering, and the shoe is slowly filling up with wash water; 2) Excessive speed may have allowed soil to shoot out the back, or 3) gap between electrodes and shoe may be excessive, so thinner soil cores aren't contacting pH electrodes.

-Operators who monitor the screen, and are alert to pH values that aren't appropriate for the Cycling or Recording phase, generate better maps.

-Whenever the final pH readings at a sample location are  $>.50$  apart, an alarm will sound indicating data for that sample location will likely be eliminated during data extraction. If more than an occasional reading is rejected, inspect the sampler assembly for possible plugging or other malfunction, and the electrodes for proper cleaning.

-The speed you travel and your transect width directly affects the sample density: 6 mph (9.6 km/hr) on 50' (15 m) transects provides approximately 10 samples/acre (24/ha). 5 mph (16 km/hr) on 75' (23 m) transects results in approximately 5 samples/acre (12/ha).

-If a soil core is not present in trough, slow down and inspect again. Excessive field speed can cause core to eject before sampling.

-If possible, double your transect width and fill back in to return to starting point. ISE drift will be evident and should be correctable.

-Make map as soon as possible and inspect for quality; map should have spatial structure and minimal streaks or lines