

Changing the Calibration of the ECH₂O Check Handheld Reader

The ECH₂O Check reader is shipped with a factory-supplied calibration that relates the mV output of the ECH₂O probe (models EC-1 and ECH₂O -10) to the actual volumetric water content (VWC) of the soil. The equation is linear, with a slope and an intercept, and is well suited for soils with low to moderate sand content. For those who would like to input their own equation, the ECH₂O Check also allows the user to adjust slope and intercept to optimize the calibration for their particular soil. During extensive calibration of the probes, soils with high sand content were observed to have somewhat different calibration equations than those with low to moderate sand.

The factory calibration of the ECH₂O Check is changed using the two keys on the ECH₂O Check (**I** and **II**) and requires no other tools. The original factory calibration for a 2500mV excitation is:

$$\theta = 0.07 * \text{mV} - 29.0$$

for the standard ECH₂O probe (model EC-1), and:

$$\theta = .0936 * \text{mV} - 38.0$$

for the shorter ECH₂O probe (model ECH₂O-10), where 0.07 and 0.0936 are the respective slopes, and -29 and -38 are the respective intercepts, mV is the output of the probe and θ is VWC in percent. The numbers for slope and intercept displayed on the ECH₂O Check are multiplied by 10,000 and -10, respectively (screen slope: 070, screen intercept: 290). To change these values, turn the ECH₂O Check on and press and hold down the right button (**II**) for two seconds. After two seconds, and while still holding down the right button, firmly press and

release the left button (**I**) and then release the right button. The screen should flash, and then show a three-digit number (070), followed by a “**S u**” in the upper right corner. The S stands for slope, and u indicates up.

On this screen, the slope value can be adjusted up by pressing the left button (**I**) (each depression results in a increase of 1, i.e. press the button once and the slope will change from 070 to 071). After adjusting the slope up (if desired), press the right button (**II**) to advance the screen to another three-digit number followed by a “**S d**” (the “d” represents down). On this screen, the slope can be adjusted down using a similar technique as the up adjustment. Press the right button (**II**) again and the screen will show three digits (290) followed by an “**i u**”. On this screen, the i stands for intercept and u indicates up. By pressing the left button (**I**), the intercept value will increase by an increment of 10 per depression (e.g. it would advance from 290 to 300). When finished adjusting the slope up, press the right button (**II**) to advance to the next screen. The “**i d**” in the corner indicated the intercept can be adjusted down on this screen in the same manner as before.

Pressing the right button (**II**) again will advance the display to the **Sto** screen, where pushing the left button (**I**) will store the slope settings. If the right button (**II**) is pushed, the screen will return to the “**S u**” or slope adjustment up screen and no values will be stored. The left button (**I**) must be pushed when the screen is showing “**Sto**” or the new calibration will not be stored. If ECH₂O Check automatically turns off before the calibration is stored (after 1 minute with no button activity), the ECH₂O Check will return from the calibration to the read mode and you will need to begin the process again.