FALKER

User Manual

Digital Soil Hydraulic Conductivity Meter

SoloFlux

SFX1050

Revision B

May/2025

MAN_SFX1050

This product was developed in partnership with

To facilitate understanding and highlight important aspects, some information is specially formatted, as indicated below.

Note:
They present some detail or better explain some point of the text.

ATTENTION:
Indicates points to be observed by the user for the correct use and maintenance of the equipment.

CAUTION:
Warns you of situations that could permanently damage your equipment or cause other serious damage.

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Índice

1 Introduction

SoloFlux is an automated digital meter that measures soil permeability to water movement. It is a modern, practical, and efficient piece of equipment that determines the hydraulic conductivity of saturated soil, commonly referred to as Kfs. Determining this variable (Kfs) allows us to characterize the physical and structural quality of soils, as well as predict water movement in response to precipitation events, irrigation depths, drainage processes, and upward movement of water in the soil. In addition, it is essential for understanding the soil's ability to conduct, distribute, and drain water, and is an essential parameter for determining the recharge of water bodies.

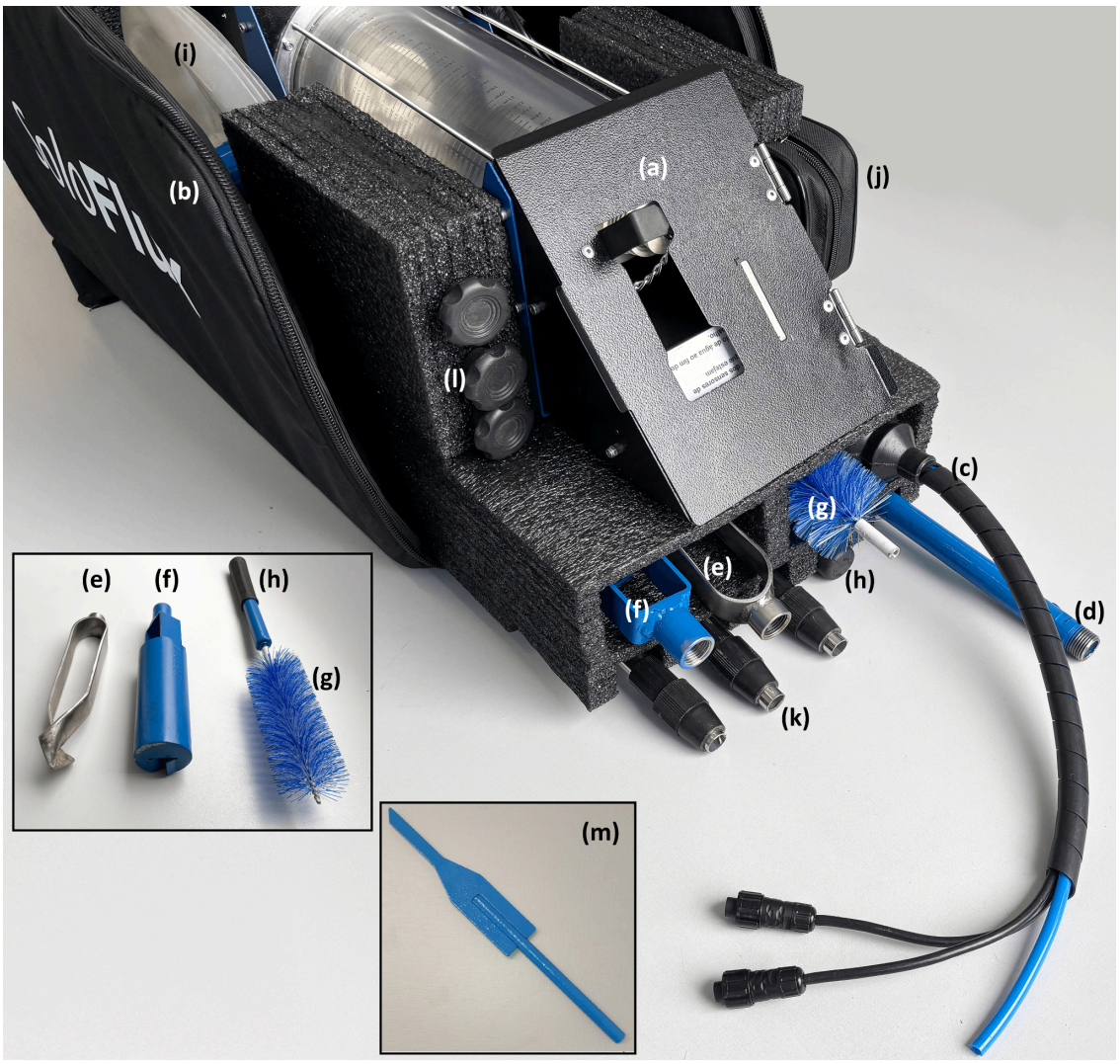
This manual covers aspects related to the use of the equipment and provides guidelines for using the Falker Flow Web Application and App, which allows viewing and analyzing the collected data. This document is not a manual of recommendations and interpretation of data, nor does it cover actions after the measurement, related to the use of the data.

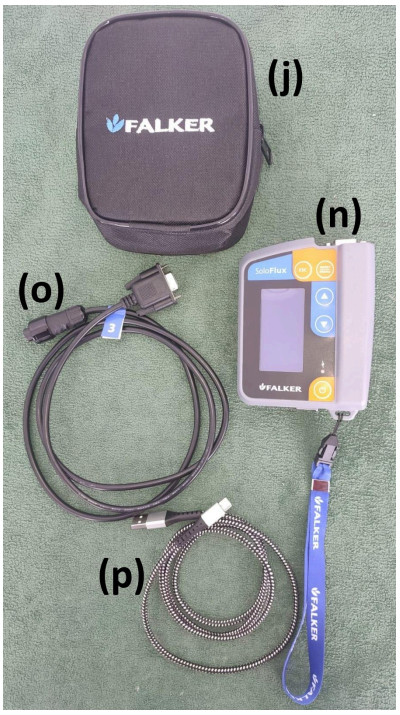
Thank you for choosing Falker!

2 The Equipment

The equipment is supplied in a canvas backpack, suitable for use and transport in the field. The following items are supplied:

(a) 01 SoloFlux Permeameter (SFX1050)
(b) 01 Protective backpack
(c) 01 Measuring Probe
(d) 01 General fixing rod
(e) 01 Attachable Dutch Auger
(f) 01 Attachable Mug Auger
(g) 01 Attachable brush
(h) 01 Brush coupling rod
(i) 01 Gallon foldable
(j) 01 Case for electronic module and cables
(k) 03 Telescopic legs
(l) 03 Fixing knobs for the legs
(m) 01 Spatula wrench (cleaning and decoupling)
(n) 01 SFX1050 Electronic Module
(o) 01 Connection cable for the electronic module
(p) 01 USB-A USB-C cable
(q) 01 "T" handle (for general fixing rod)
(r) 01 Cup (for test and cleaning of Measuring Probe)





ATTENTION:
It is a precise measuring device, so the SoloFlux (SFX1050) must be transported with care. The equipment's backpack was designed to protect it in the best possible way during transport, while also being practical to use. It is not a package for shipping as cargo at airports or bus stations, for example.

2.1 Accessories

In addition to the items that come with the equipment, the following codes can be used to purchase accessories or replacement items.

Table 1: Commercial Codes for Accessories

SFX8210	SFX1050 Electronic Module
SFX8010	Connection cable for the Electronic Module
FLK9020	USB-A USB-C cable
SFX8310	Protective backpack
SFX8110	Measuring Probe
FLK8610	Attachable Dutch Auger
FLK8620	Attachable Mug Auger

FLK8630	Attachable Brush
SFX9000	Gallon foldable
SFX8410	Spatula wrench
SFX8510	Telescopic legs
SFX8610	Cup for instructions and cleaning

3 Basic Concepts

This chapter presents basic concepts for the user to obtain data correctly.

3.1 Water movement in soil

Infiltration is the process of water entering the soil profile, passing from the surface to the subsurface. Percolation or conduction is the movement of water in the subsurface. Saturated hydraulic conductivity is a variable associated with the ease with which water moves within the soil when saturated with water. The movement of water in the soil is an indicator of physical quality (especially of the soil's porous space, in terms of pore size and continuity). It is one of the attributes most sensitive to changes in the structural quality of the soil. It can be a complementary data to penetration resistance, since it integrates volume, size, continuity, tortuosity, and interconnection of the soil's porous system.

3.2 Hydraulic Conductivity versus Compaction

Changes in soil structure alter the soil-water-air relationship in the system. Soil compaction rearranges the particles, increasing density as a result of reduced soil volume and expulsion of air from the pores. Penetrometry is commonly used to assess the state of soil structure and restrictions on root growth; these measurements are affected by particle size, water content, and mineralogy.

The hydraulic conductivity of saturated soil (Kfs) has an inversely proportional relationship to the resistance to penetration, since water circulates through the macropores, which are reduced as soil compaction intensifies. With this reduction, microporosity increases and allows for greater water storage in the soil. Thus, soil hydraulic conductivity can be used to characterize abrupt changes in macroporosity and illustrates greater sensitivity than penetration resistance for this type of analysis.

Regarding the influence of soil moisture, at the time of measurement, the final Kfs data is lower than that of penetrometry, for example. This occurs because when Kfs is obtained, that is, when the data obtained becomes constant after the pores of the saturation bulb are completely filled with water, the initial moisture has less relevance, even though the measurement cannot be started in an already saturated soil. Thus, SoloFlux, like other well permeameters, obtains saturated hydraulic conductivity data from unsaturated soil.

3.3 Measuring

3.3.1 Choosing the type of soil

To use the SFX1050 correctly, it is essential to understand the physical characteristics of the soil where the measurement will be performed. Each type of soil structure directly influences the final result obtained in the Kfs calculations. The table below presents a description of the types of soil structure for selection to be used in the Kfs calculations in the electronic module.

Type of soil	Description
Type 1	**Compacted**, unstructured, clayey, or silty soils. Example: lake or marine sediments, etc.
Type 2	Fine-textured soils (clayey or silty) and **unstructured soils**. May include fine sands.
Type 3	Covers most horizons of **structured** clay soils (**Latosols and Argisols**). Unstructured fine and medium sand soils. The most used category for arable soils in tropical regions.
Type 4	Coarse sand soils may include some **highly structured** soils with high macroporosity. This class **includes most horizons of Quartzarenic Neosols and Spodosols**.

3.3.2 Hydraulic Head (H)

The hydraulic head refers to the height of the water layer (in cm) inside the measuring well (aka cylindrical drilling in the ground with a diameter of 6 cm). The measuring well must be opened with the accessories that come with the equipment (details in section 4). The SFX1050 measuring set has sensors applicable to 5 cm and 10 cm of the H.

The measuring set must be positioned perpendicular to the base inside the well. Visually noticeable inclinations may affect the expected applied hydraulic head. For calculation purposes, the tools that come with the equipment must be used, as changes in the well diameter will generate distorted results (as they differ from the equipment parameterization).

The SFX1050 Electronic Module uses the Measuring Probe to monitor the water level in the well. It has sensors coupled at 5 cm and 10 cm in height with the external face of its base. As the water percolates into the soil and the water level falls below the H selected in the measurement, the water from the reservoir is released until it reaches the H level again; that is, an automatic **leveling of the water in the well** is carried out, keeping the H constant.

3.3.3 Stopping criterion used in the evaluation of water flow in the well (Q)

In the SFX1050, there is no need to monitor the measurement in real time. The equipment has two general evaluation criteria with automatic stop: time and water volume. These criteria types must be selected when creating a new job. Each job has only one type of stop criterion. However, in each new measurement, different values can be selected for the selected stop criterion:

1. **Time criterion:** The user can choose the measurement time from four options: 10 min, 30 min, 1 hour, and 2 hours.

2. **Water volume criterion:** In the volume criterion, the user can choose a maximum volume of water used in the flow evaluation. The possible selection values are: 250 mL, 500 mL, 1000 mL, 2000 mL, 3000 mL.

3. **Water flow stability criterion:** In this criterion, the user can select two modes.

   3.1. ***Mode 1:*** is based on **the time between well levelings**. This method identifies when the period between well levelings (ΔT) is repeating, i.e., it detects when ΔT has stabilized at a constant value. Due to the precision of the electronic sensor system, a tolerance of 2% variation in the time value between one leveling and another will be considered, that is, **$\Delta T = t_i - t_{i-1} = t_c$ (± 2%)** [seconds] (where **t_c** is the period that is repeating between the instant **t_{i-1}** of one leveling and the instant **t_i** of the next leveling). After ΔT reaches a value with a variation less than or equal to 2%, the algorithm will consider that the water flow has stabilized when it observes that **ΔT will repeat itself at least 3 consecutive times** and, in addition, **a minimum time of 10 minutes has elapsed since the first determination/detection of ΔT**. Mode 1 will arbitrarily condition that **the total measurement must have a minimum duration of 20 minutes** from the moment the measurement was started (see section “5.3 Data

Acquisition" - "New Measurement"), regardless of the type of soil and the hydraulic load that the user selected in the job.

3.2. ***Mode 2:*** is based on identifying when **the soil hydraulic conductivity value (K) becomes constant**, i.e., each time the main electronic module acquires data, the K value at that moment (K_i) will be calculated. When the K_i value repeats consecutively (taking into account a certain tolerance), then K_i will be considered constant (the soil has reached the water saturation point Kfs). Depending on the precision of the electronic sensor system, a tolerance of 'p' [%] of variation in the K_i value will be considered, i.e., **if (K_i/K_{i-1}) = 1 (± p%) then K_i = Kfs [cm/h]**. After identifying the repetition of K_i, the algorithm will consider that the water flow has stabilized by monitoring that **its repetition has remained, consecutively, for at least 'Y' minutes**. Arbitrarily, this mode will condition that **the total measurement must have a minimum duration of 'Z' minutes** from the "start" moment that the user gave (see section "5.3 Data Acquisition" - "New Measurement"), regardless of the soil type and the well type (hydraulic load) that the user selected in the job. Mode 2 offers two criticality options:

a) 'p' at 2%, 'Y' at 10 minutes, and 'Z' at 25 minutes;

b) 'p' at 3%, 'Y' at 06 minutes, and 'Z' at 10 minutes.

3.4 Theory

Hydraulic conductivity calculations performed on the SFX1050 are based on stabilized water flow and the choice of soil structure type. The following table shows the coefficient variations for each soil structure type.

Type of soil	$\alpha\ (cm^{-1})$	**Shape Factor**
Type 1	0,01	$C_1 = \left(\frac{\frac{H_1}{\alpha}}{2{,}081+0{,}121\left(\frac{H_1}{\alpha}\right)} \right)^{0{,}672}$
Type 2	0,04	$C_1 = \left(\frac{\frac{H_1}{\alpha}}{1{,}992+0{,}091\left(\frac{H_1}{\alpha}\right)} \right)^{0{,}683}$
Type 3	0,12	$C_1 = \left(\frac{\frac{H_1}{\alpha}}{2{,}074+0{,}093\left(\frac{H_1}{\alpha}\right)} \right)^{0{,}754}$
Type 4	0,36	$C_1 = \left(\frac{\frac{H_1}{\alpha}}{2{,}074+0{,}093\left(\frac{H_1}{\alpha}\right)} \right)^{0{,}754}$

H_1: Hydraulic head (cm)

Depending on the reservoir's geometry, the variation in water volume over time (R_1) is determined to estimate the Water Flow (Q_1). With the water volume fixed (by

maintaining H_1 in the well), the flow rate for calculating hydraulic conductivity (K) is found.

Unique Hydraulic Head	$Q_1 = \overline{R}_1 \times 162,86$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi\alpha^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$

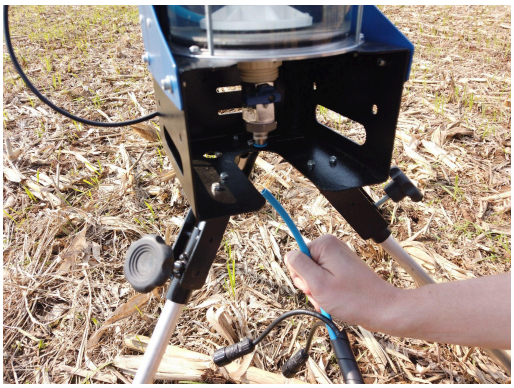
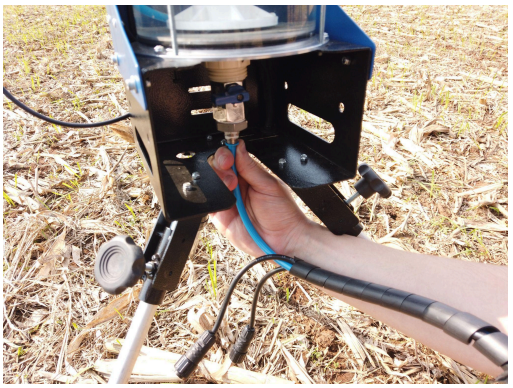
4 Installation

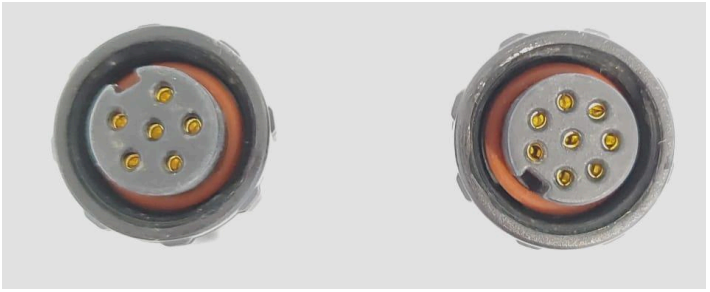
4.1 Assembly and preparation

When you arrive at the measurement location, position the backpack with the loading straps facing down to facilitate removal and maintain the reservoir's integrity. Remove the SFX1050 permeameter.

Start the assembly by attaching the legs of support (fixing them to the base of the equipment).

With the structure assembled, connect the measuring set to the corresponding connector, starting with the hydraulic connection and then with the other connectors, ensuring that the cables fit perfectly, paying attention not only to the connection of the pins but also to the complete fitting of the lateral groove.



Connect the “T” gripper and the Dutch auger to the general clamping rod.



Position the Dutch auger perpendicular to the ground or vertically in case of noticeable slope in the presence of slightly sloping terrain.

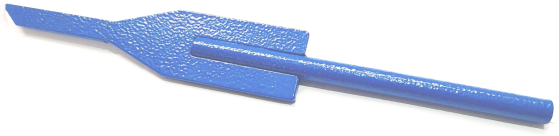
CAUTION:
Use the auger vertically to avoid any type of inconsistency with the shape and diameter of the well.

Turn clockwise, pressing the auger into the soil to the desired depth and remove it so as not to widen the measuring well.

This auger should be drilled without forcing the auger to avoid compacting the bottom or the sides of the soil. Avoid doing this in very dry or very wet soils (especially clayey soils).

Once this is done, uncouple the Dutch auger using the wrench that comes with the equipment.

Support spatula wrench for uncoupling tools.



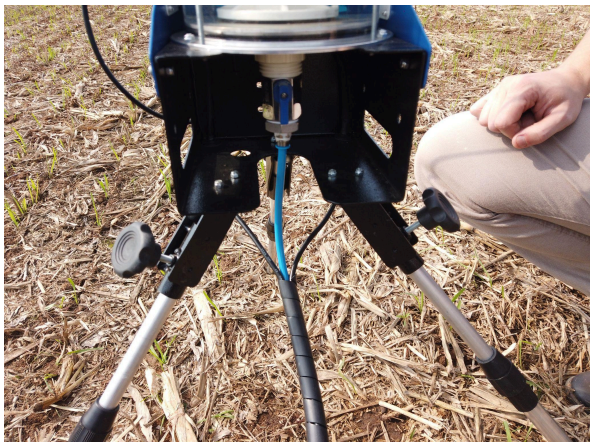
After that, attach the bucket auger to the main shaft and insert it to level the bottom and walls of the well.

After this, uncouple the auger and attach the brush to the shorter fixing rod. Insert it into the well and make vertical movements, that is, in the direction of the well, to unclog the pores and reduce the mirroring of the side walls, especially in clayey or very clayey soils.


Position the Measuring Probe in the well.

CAUTION:
Always keep the Measuring Probe hose as vertical as possible. If the hose bends, leaks may occur at the pneumatic connections.

Check that the water tank valve is in the horizontal position (closed).




Open the top front cover, remove the stopper from the filling nozzle, and fill the reservoir with water up to the lower limit of the nozzle, avoiding overflow. Then, insert the stopper back into the filling nozzle, ensuring that the opening is completely sealed.

Connect the external cable to the Electronic Module (DB9 connection) in the corresponding 8-way connector located in the upper left corner of the equipment.

CAUTION:
For proper sealing, press the rubber stopper firmly. If not fitted correctly, air may enter the reservoir, affecting the measurement.

5 Operation

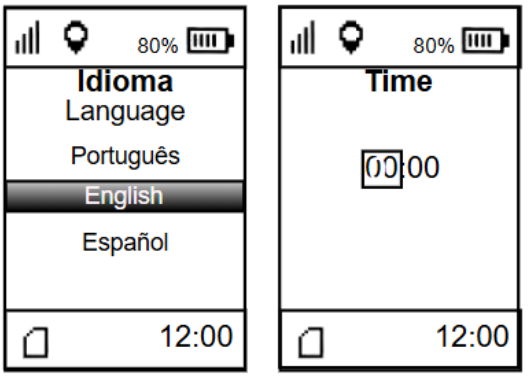
5.1 First use of the Electronic Module

To turn on the electronic module, press the power button ( ) on the left side of the panel. To turn off, press and hold the power button for at least 5 seconds.

The navigation between menu options is done using the “UP” ( ) and “DOWN” ( ) keys. The “ENTER” ( ) key selects the chosen option. The “ESC”( ) key returns to the previous menu.

When using the SFX1050 for the first time, the language and local operating time of the equipment are set.

Figure 1: First use screens



To set the time, you will need to obtain a GPS signal. If a message indicating no GPS signal is displayed, look for an open-air location.

If this operation is not possible, you can set the time at another time in the device settings. To start using the device without setting a time, turn the SFX1050 off and on again. This will stop the message indicating no GPS signal.

5.2 Basic Operation

Figure 2: User Interface

The equipment is operated using the keys and the graphic screen, where measured values are shown, as well as warnings and information to the user, such as battery charge, memory usage indicator, and GPS signal.

When you turn on the device, after a startup screen, the main screen appears. This screen displays the following information based on icons: battery level and GPS positioning indication, at the top. And the time indication (only with GPS working) and memory usage, at the bottom.

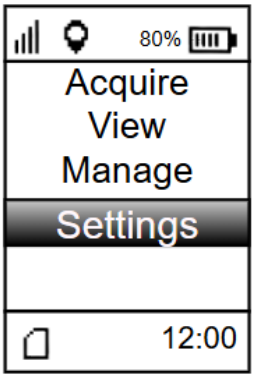
The icon with the 4 vertical bars indicates the signal strength of the onboard GPS. If there is a signal, the main screen also displays the time, based on data from the GPS itself.

Memory usage is shown by a memory card icon, represented by filling steps, which indicate memory usage.

In the main menu, there are four options:

- **Acquire:** the menu used to make new measures.
- **View:** a menu that allows you to view the data acquired from previous measurements on the equipment itself.
- **Manage:** menu that allows you to add, rename, or delete jobs and measurements from a job.
- **Settings:** a menu that allows you to change the equipment settings.

Figure 3: Main screen



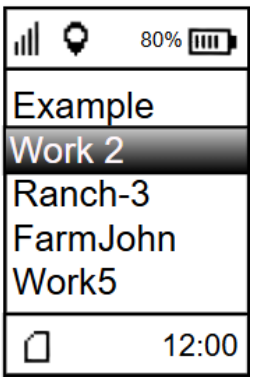
Each of the menus has internal options.

5.3 Data Acquisition

Use the “Acquire” menu to perform measurements.

After selecting the “Acquire” menu, the job selection screen will open, as shown in the figure below.

Figure 4: Job selection screen



When selecting the desired job, the following screen will open:

Figure 5: Measurement screen

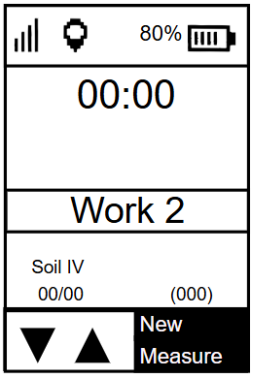
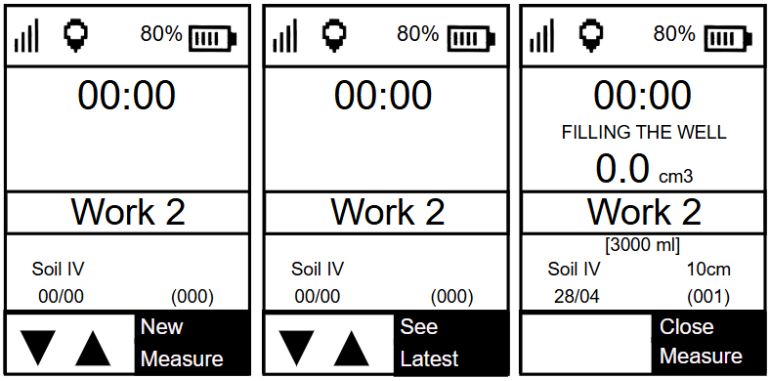


Figure 6: Measurement screen features



- **New measure:** resource used to make a new measurement at the current point. It will guide you in choosing the value of the previously selected job stop criterion (time or volume) and the well type (5 cm or 10 cm) for the new measurement.

- **See latest:** resource used to check measurements already taken in the selected job.

- **Close Measure:** interrupts the ongoing measurement. It will give the option to save this measurement. Kfs will be calculated if the duration is greater than 6 minutes. The flux data (Q) used will always be those of the last six minutes of measurement.

To start the measurement process, position the equipment at the location of interest, with the measurement well already dug, with the measurement set placed inside the well, with the reservoir full, and with the rubber cap well positioned to ensure complete sealing. On the measurement screen, press “ENTER” and **note that you will be asked to open the water reservoir valve** to release the air in the hose (at this point, the hydraulic head will not yet be generated). You will then be redirected to a screen that will allow you to select the options for ending (the type of stop) the evaluations according to the criteria established in the work (time or volume) and, subsequently, to select the desired hydraulic load for the measurement (5 cm or 10 cm). After configuring the measurement, the timer will start counting, and the sensor will start the measurement, filling the well with water up to the level of the respective hydraulic head.

By pressing “ESC” on the measurement screen, the measurement can be ended. After the measurement is finished, you can save or delete it. The data obtained during the measurement, as well as its attributes, are automatically stored in the equipment's memory. If the data was obtained incorrectly, the user can delete it later and redo the measurement within the same job.

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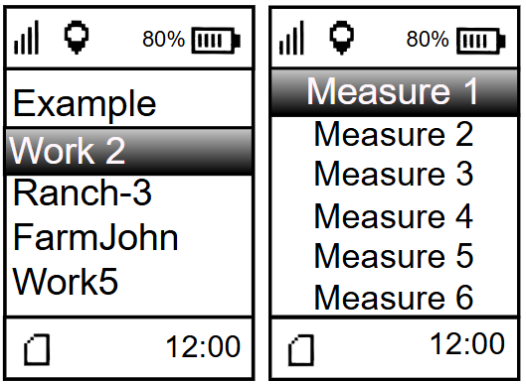
CAUTION:
To preserve the equipment, avoid impacts, falls, and exposure to rain.

5.4 Data Visualization

The **SoloFlux** has basic features for viewing data on the equipment itself, without the need for data transfer.

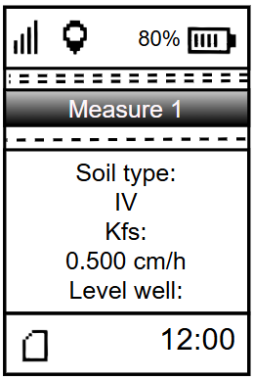
In the “View” menu, the job selection will open. After selecting the job, the list of measurements will open.

Figure 7: Screen for selecting the measurement to be displayed



After selecting the measurement, the preview screen opens.

Figure 8: Viewing point measurements



The following data is displayed on the measurement screen:

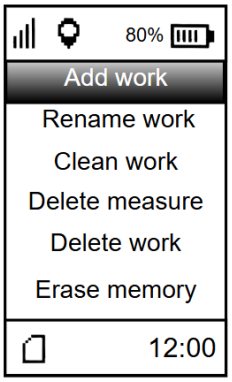
- **Soil structure type:** soil chosen when creating the job. (See Table 2)
- **Kfs:** final value of hydraulic conductivity (cm/h).
- **Well level:** value of the height of the hydraulic head chosen for the measurement.
- **Stop**: the type of stop criterion chosen when creating the job (by Time or by Volume of water).
- **Criterion:** the value of the stop criterion for the measurement. For example, '3000ml' (when stopping by 'Volume') or '1h' (when stopping by 'Time').
- **Start:** time (hour and minute) when the measurement started (according to the internal clock of the electronic module).
- **Duration:** total duration (hours and minutes) of the measurement.
- **Number of samples**: total number of samples taken during the measurement.

- **Latitude and Longitude:** GPS positioning data.
- **Date:** date the measurement was taken, in day/month/year format.

5.5 Management

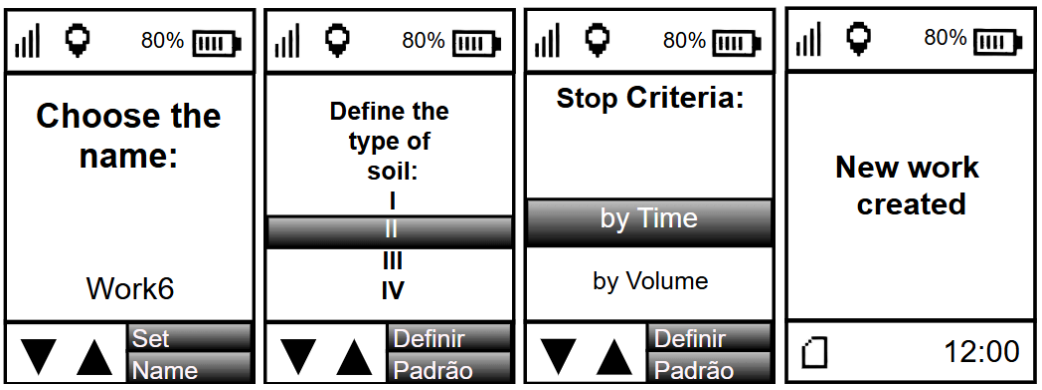
When you select the “Manage” menu, the following screen opens.

Figure 9: Manage screen



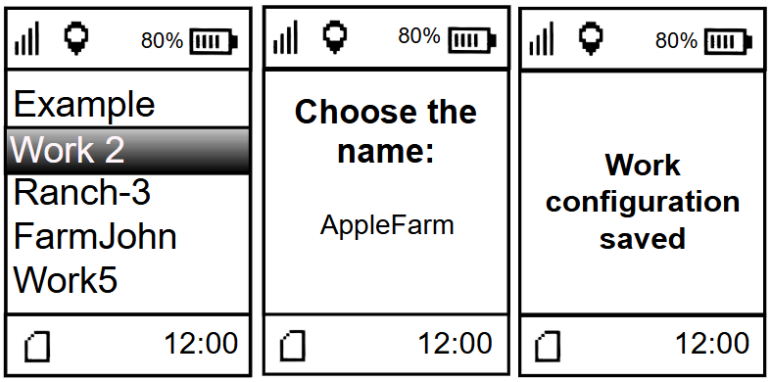
When you click on the “Add work” menu, the screen for choosing the name of the new job will open. To choose the letters, use the directional arrows. To confirm the letter, press the “ENTER” key to select. After choosing the name, the screen for choosing the soil type of the new job will open. Finally, you must choose the stopping criterion used to end the measurements. The figure below shows the sequence of screens in the “Add work” menu.

Figura 10: Add work screens



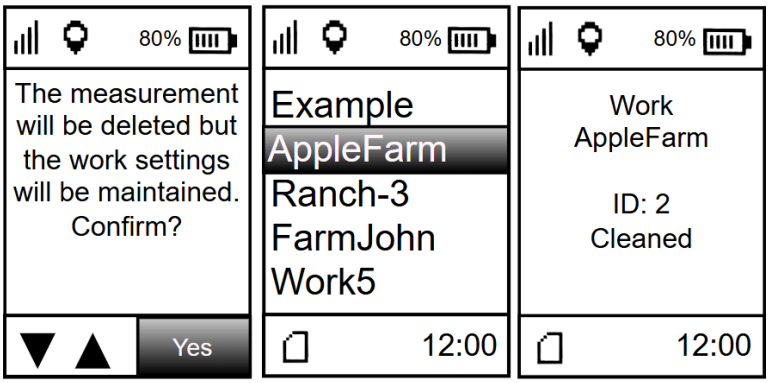
By selecting the “Rename work” menu, you can edit the name of an existing job. The figure below shows the sequence of screens in the “Rename work” menu.

Figure 11: Rename work screens



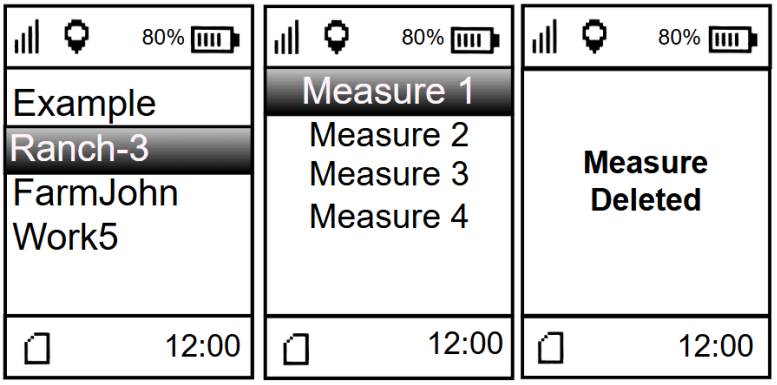
By selecting the "Clean work" menu, a warning screen will open informing you that the measurements will be deleted, but the structure will remain. On the same screen, confirmation is required to continue. On the next screen, you will be asked to select the job whose measurements will be deleted. The last screen is the confirmation of the action. The figure below shows the sequence of screens in the delete measurements menu.

Figure 12: Clean work screens



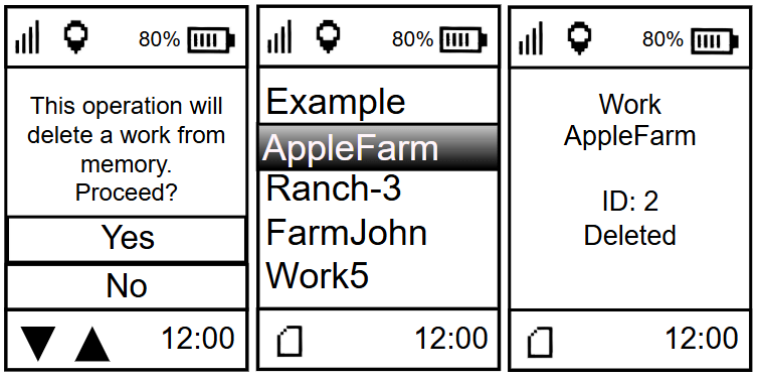
By choosing "Delete measure" from the menu, you can delete only one measurement at a time, keeping the job configuration and other measurements unchanged. The first screen that opens asks you to choose the job that will have a measurement deleted. On the second screen, you must choose the measurement to be deleted in this job. The last screen confirms that the action was performed correctly.

Figure 13: Delete measure screen



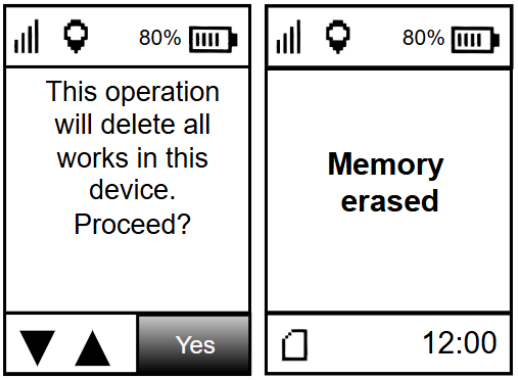
By choosing the “Delete work” menu, you can delete the entire structure of a previous job. The first screen that opens informs you of what the operation will do and requires confirmation to proceed. On the second screen, you must choose the job to be deleted. The last screen confirms that the action was performed correctly.

Figure 14: Delete work screens



Selecting the “Erase memory” menu will open a confirmation screen, warning that all work and measurements from the device will be erased. If “yes” is selected, the confirmation screen will open, warning that the action was performed correctly.

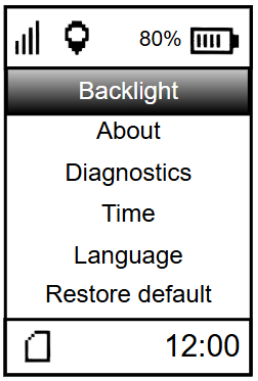
Figure 15: Erase memory screens



5.6 Settings

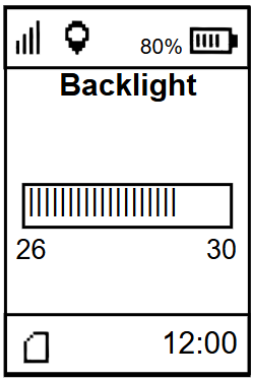
When you select the “Settings” menu, the following screen opens.

Figure 16: Settings screen



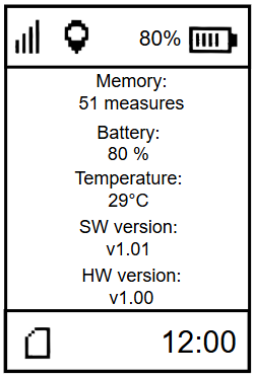
In “Screen brightness”, you can change the brightness intensity of the equipment’s display.

Figure 17: Screen brightness screen



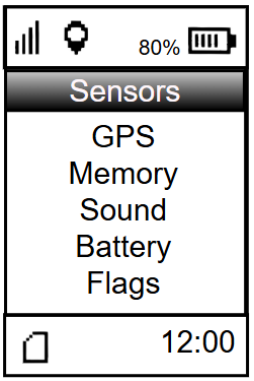
In “About” you can check information about how many measurements are stored in memory, the battery charge level, the battery temperature, software and hardware versions, serial number, among other information.

Figure 18: General information (About) screen



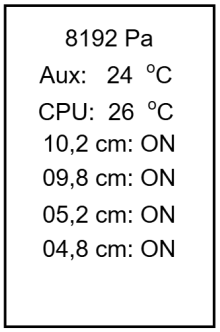
In the “Diagnostics” menu, some more specific information about the Battery, GPS, Memory, Sound, Sensors, and Flags can be obtained.

Figure 19: Diagnostics screen



Among these, information related to the sensors allows checking the current conditions of the equipment, making it possible to identify whether there are problems with the interpretation of the sensors in the measurement set, the pressure sensor, and the valve actuation.

Figure 20: Diagnostic of sensors screen



This makes it possible to check the individual conditions of the sensors in the measuring set inside and outside a container with water, in addition to listening to the sound of the valve being activated, which will always be in operation, as well as the pressure and temperature readings from the device's sensors.

To diagnose the sensors' operation, fill half of the cup with the equipment with water and insert the measuring set. As the measuring set is inserted into the water, the sensors' status will change from “OFF” to “ON”, indicating that they are working.

5.7 GPS onboard

The **SoloFlux** model 1050 already has an internal GPS, which allows all measurements to be georeferenced and even records the date and time they were taken. This model does not require an external antenna or cables and accessories for this purpose. As an indication, the **SoloFlux** screen will have two icons to check the GPS signal.

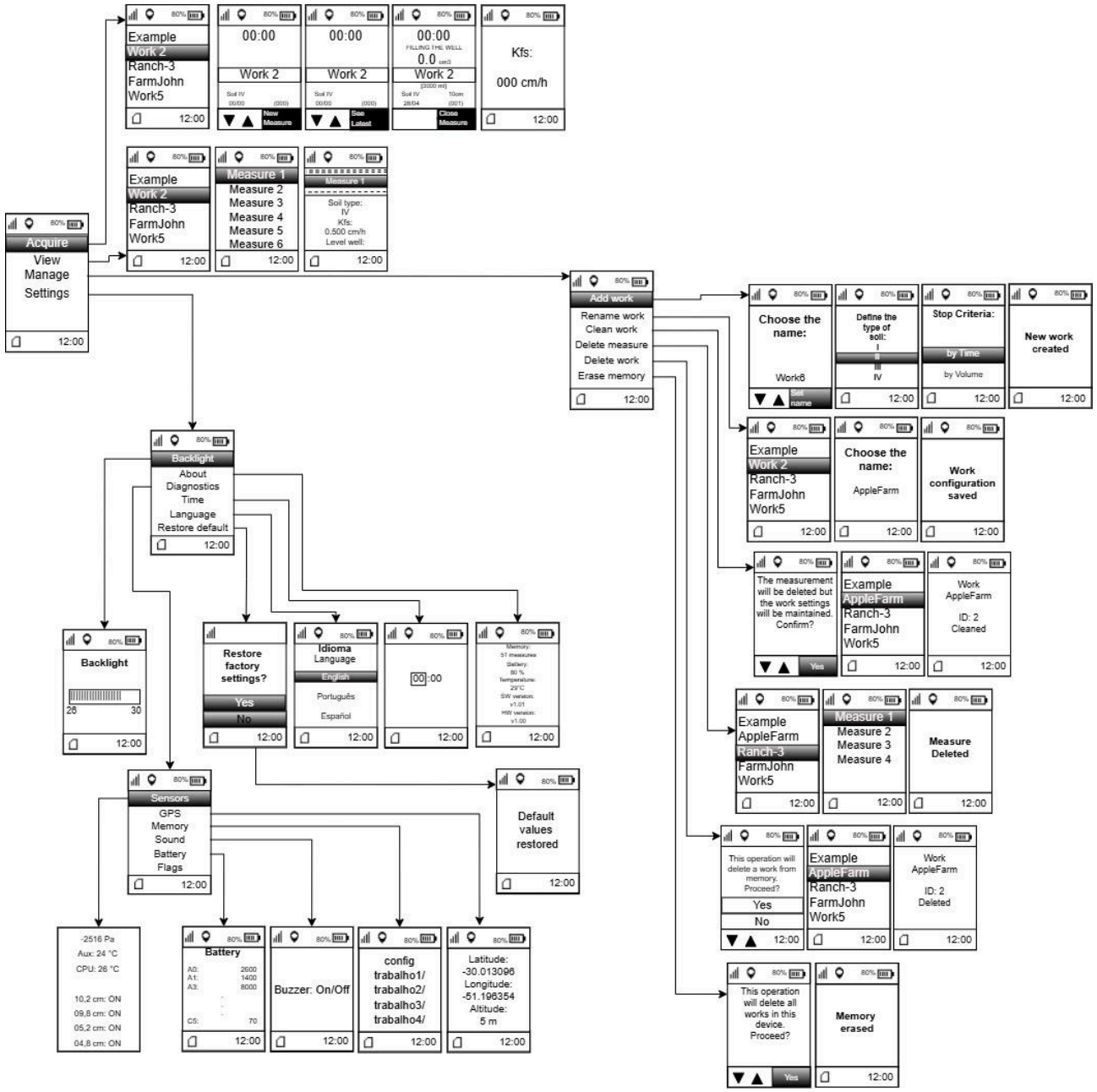
An icon indicates whether the device has been able to calculate the current position. To do this, the device must have at least 3 satellites visible, as the GPS signal depends on triangulation between satellites to determine the current position. The accuracy of the position will depend on the quality of the signal.

The other icon identifies the signal strength.

The 4 levels indicate the accuracy of the data acquired by the GPS. For better accuracy, it is recommended to always wait for the signal to have 4 bars, aiming for greater accuracy in the acquired coordinate. Depending on the weather or environmental conditions, such as clouds, buildings, and trees, it may not be possible to obtain 4 bars.

5.8 All Screens

Figure 21: Navigation of the equipment screens



5.9 Falker Flow - Data Visualization and Analysis

FALKER FLOW

The Web Application can be accessed at:

flow.falker.com.br

And the App is available for Android devices on the Google Play Store platform. Search for "**Falker Flow**"

SoloFlux has a specific Web Application and App for viewing and analyzing the collected data.

In an online system, with data saved in the cloud and automatic synchronization between Web and App, you can access information from anywhere for analysis or sharing. It also allows the generation of measurement reports for presentation.

Note:
The Falker Flow System for transferring and analyzing data on the computer is constantly evolving.
Please follow the instructions directly in the system.

The System also allows you to customize and export reports to present measurement results, including graphs, parameters, and attributes of the data collected.

5.10 Data Transfer

Data transfer can be done in two ways:

- **USB cable:** Connect a USB cable to the USB-C output of the device with it turned off.

The data must then be sent to the Falker Flow web system via a computer. Windows will open a directory called "SFX1IMG.FSX" where the file will be available to be copied. The file format is ".FSX".

- **Bluetooth:** Pair the device with a smartphone and transfer the device's measurements to the App via Bluetooth. The first time the smartphone receives an internet signal, it will automatically synchronize the data in the cloud, in the Falker Flow system.

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6 Basic Maintenance

6.1 Battery charging

The SoloFlux has an internal battery that must be charged using the original cable, connected to a wall charger with a USB output of **only 5 Vdc** or to a device with a USB type A input (notebooks, for example). Avoid using chargers that are not approved by the responsible authorities.

The connector compartment is protected by a sliding cover. Access is gained by moving the cover to the right.

Figure 22: Access to connectors

During charging, the red LED remains on. When charging is complete, the LED turns off (some chargers may have the LED flashing).

6.2 Equipment Cleaning

Keep the device clean, removing the dirt from contact with the ground with a dry cloth.

The device is not waterproof. However, it is splash-resistant, so care should be taken in the area around the USB-C connectors.

6.3 Cleaning the Measurement Probe

To ensure that the measurement set is clean, you must access the sensor diagnostics screen to monitor the interactions of the sensors displayed. When observing the sensors turning on and off, you should expect them to turn on when submerged in water (ON) and turn off when out of water (OFF).

After this, immerse the set in the cup filled with water and repeat the process to check whether the level sensors follow the logical sequence, based on the immersed length of the set from the lower tip.

If one of the sensors is dirty, it will not turn off correctly (staying in one state). Therefore, immerse and remove the assembly quickly and successively until the sensors are operating normally (which will indicate that they have been cleaned effectively). If the instructions above are not sufficient and the problem persists, contact Falker.

6.4 Software update

The equipment's embedded software, which controls its operation, can be updated by the user using files provided by Falker.

To do this, you must enter the mode called “Bootloader”. With the equipment turned off and disconnected from the charger, press and hold the  and  keys.

Keeping both keys pressed, turn on the device using the  key. The device's display will remain off or the “Bootloader” indication will be displayed. Now the device has entered Bootloader mode.

After that, connect the equipment to the computer, using the same charging cable.

Your computer will recognize SoloFlux as a removable media with the name “SFXBOOT”, which can be found by clicking on “My Computer” (on computers with Windows operating systems).

Find the file provided by Falker (for example, SFX1050_v101.fs2). Select the file and drag it to the “SFXBOOT” folder in “My Computer”. The update process is automatic and takes less than 10 seconds.

CAUTION:

Do not attempt to update the software using files that you are not sure were provided by Falker and that are suitable for your equipment version. Attempting to update with files that are not suitable may require maintenance by Falker.

The product software update is a feature that exists to allow the improvement of the equipment and the possible addition of new functions without the need to return the equipment to Falker.

6.5 Other questions

If you require any other type of maintenance or have questions not covered in this manual, please contact Falker.

www.falker.com.br

falker@falker.com.br

7 Technical Specifications

The following table presents the main technical information of the equipment.

Table 5: Technical Specifications

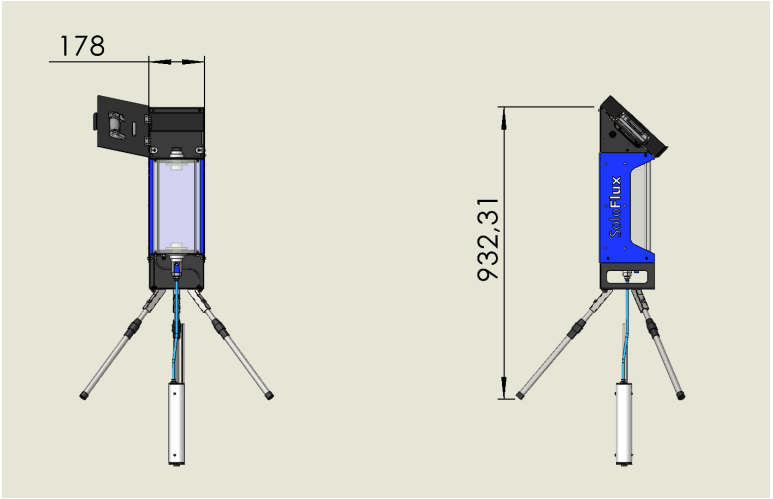
	SFX1050
Reservoir volume	4,6 L
Maximum measuring depth	60 cm*
Applicable hydraulic head	5 and 10 cm
Resolution of a Measurement	0,1 mm of water column
Precision	±0,5 mm of water column
Duration of a Measurement	Depends on the soil and the selected stopping criteria
Memory capacity	520 KB
Source	Internal rechargeable battery via USB-C connector
Battery Life	More than 20 hours of use**
User Instructions	Graphic LCD Screen with Backlight Audible indication
User Keys	4 for operation, 1 on/off
Equipment Weight	15 kg
GPS Module	Onboard, embedded
Communication	USB and Bluetooth
App/Software Web	Falker Flow

*For greater depths, contact the sales team.
**Depending on the selected stopping criterion.

7.1 Dimensional Information

The dimensions of the equipment are shown in the figure below.

Figure 23: Dimensions in mm



7.2 Anatel approval

This product contains the Bluetooth board homologation code 05118-16-10070.

Revisões:

(somente para USO INTERNO)

Autor: Catia Chaves e Gabriel Neves
Revisor: Giovani Garcia
Data: 29/04/2025
Revisão: A
Descrição:

- Criação do documento.
- Aplicadas as melhorias da revisão B do manual em língua portuguesa para esta versão.

Autor: Giovani Garcia
Revisor: Catia Chaves
Data: xx/05/2025.
Revisão: B.

Descrição:

- Adição dos critérios de parada por estabilidade (criado na versão v1.02 do software do produto)