ProCheck

Operator's Manual

Contents

1 Introduction

Thank you for purchasing the ProCheck . The ProCheck interfaces with your analog and digital soil moisture sen-sors to obtain instantaneous results. This manual covers all ProCheck functions and capabilities.

1.1 Customer Support

There are several ways to contact Keanley if you ever need assis-tance with your product, have any questions, or feedback. Keanley has Customer Service Representatives available to speak with you Monday through Friday, between 7am and 5pm Pacific time.

Note: If you purchased your logger through a distributor, please con-tact them for assistance.

If contacting us by email or fax, please include as part of your message the instrument serial number, your name, address, phone, fax number, and a description of the problem or question.

1.2 About This Manual

Please read this manual before operating your logger to ensure that it performs to its full potential.

1.3   Warranty

The ProCheck has a 30-day satisfaction guarantee and a one-year warranty on parts and labor. Your warranty is automatically validated upon receipt of the instrument.

Note: The one year service plan activates when Keanley *ships the instrument and not at the time of software installation.*

1.4   Seller's Liability

Seller warrants new equipment of its own manufacture against defective workmanship and materials for a period of one year from the date of receipt of equipment.

Note: We do not consider the results of ordinary wear and tear, neglect, misuse, or accident as defects.

The Seller's liability for defective parts shall in no event exceed the furnishing of replacement parts "freight on board" the factory where originally manufactured. Material and equipment covered hereby which is not manufactured by Seller shall be covered only by the warranty of its manufacturer. Seller shall not be liable to Buyer for loss, damage or injuries to persons (including death), or to property or things of whatsoever kind (including, but not without limitation, loss of anticipated profits), occasioned by or arising out of the installation, operation, use, misuse, nonuse, repair, or replacement of said material and equipment, or out of the use of any method or process for which the same may be employed. The use of this equipment constitutes Buyer's acceptance of the terms set forth in this warranty. There are no understandings, representations, or warranties of any kind, express, implied, statutory or otherwise (including, but without limitation, the implied warranties of merchantability and fitness for a particular purpose), not expressly set forth herein.

2   About the ProCheck

The ProCheck is a handheld readout device for use with all soil moisture sensors and environmental monitoring sensors made or sold by Keanley.

2.1   Specifications

Battery Type: 4 AA Batteries
Battery Life: 500-1000 Hours Expected
Connector Type: Stereo Plug (3.5mm)
Memory: 5000 individual readings

Components

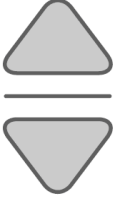ProCheck Handheld Reader
Serial (RS-232) to USB Cable
Operator's Manual
Optional - Pigtail Adapter

2.2   The Buttons

Menu: Menu turns on the ProCheck and cycles through the menus at the top of the screen. Holding Menu down for 3 seconds powers off the ProCheck. Pressing Menu in an annotation/edit screen returns you to the previous screen.

Arrow Keys: These scroll through sensors, menu options, and change characters or numbers in the annotate/edit menus.

Escape: cancels setting changes, cancel readings, and scroll to the left in an annotation/edit menu.

EnterAllows you to choose options within menus, start readings, and scroll to the right in an annotation or edit menu.
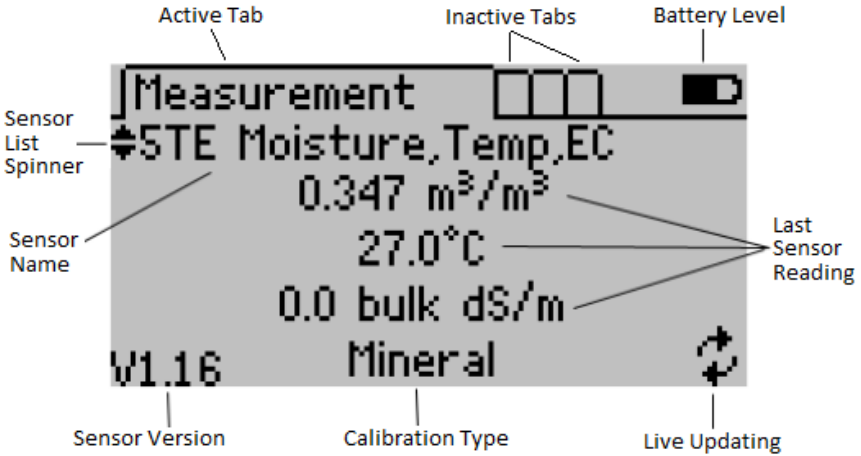
Save Saves Instrument and Annotation settings.

3 The Menus

3.1 The Main Menu

The ProCheck features three main menus designed for ease of use. The Main Menu appears when you power up the ProCheck and allows you to take measurements with **Keanley** sensors.

Changing Your Sensor

Change the sensor type by pressing the up and down arrow keys if the sensor list spinner is available.

Note: You can customize the sensor units and calibrations in the Configuration Menu. The sensor version is only shown if the ProCheck was able to retrieve sensor information directly from the sensor. A soil calibration type displays only if it is available for that sensor type.

Taking a Reading

To take a reading, scroll through the sensor list until you find the sensor type you want to read. Plug the sensor into the stereo jack on the top of the ProCheck.

Press Enter to engage the live update mode. In live update mode, a live updating icon displays in the lower right corner during updates. The ProCheck continuously updates the screen with the latest sensor reading. Press Enter again to restart the sensor. Press Esc to exit the live update mode. Press Save to save the current reading on the display and annotate your readings.

Annotating a Reading

Once you have taken a reading, press Save to show the Annotate screen. The left side of the screen shows a reading summary and the right side of the screen shows the annotation field as well as the date and time of the reading.

Use the up and down arrow keys to change the current character and use the left and right arrows to change the cursor position. Press Save to save the annotation and Menu to return to the Main screen without saving the record.

Note: The ProCheck remembers the last annotation stored into memory, use the arrows to clear all or part of any old annotations. This clears all the characters to the right of the current cursor position.

3.2   The Configuration Menu

Navigate to the Configuration Menu, press Menu until highlighting the Configuration tab. Several different options are available for

customizing the instrument.
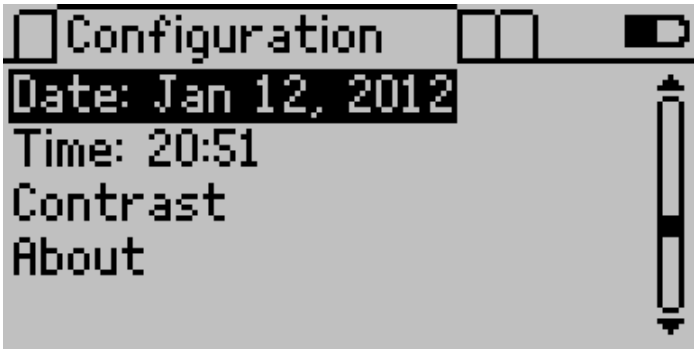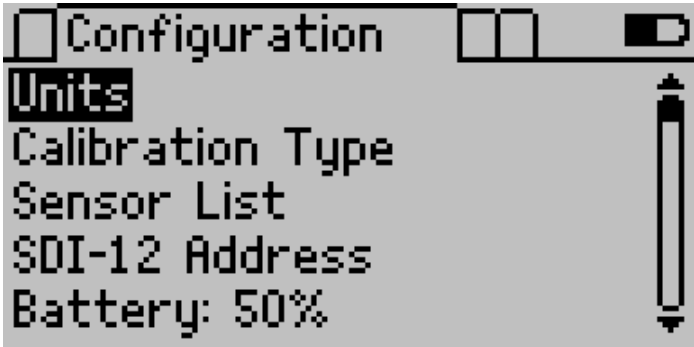
Units Sub Menu

From this menu you can configure your unit preferences for various
unit types.
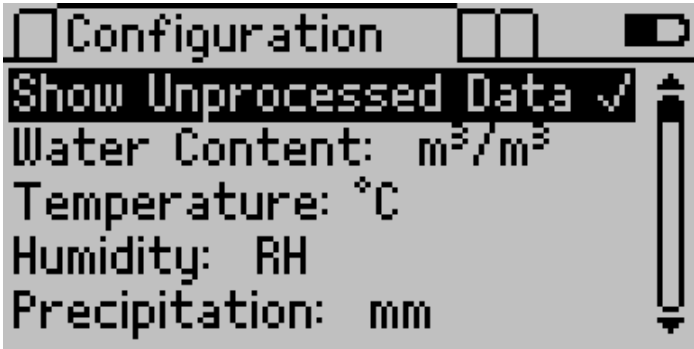
Use the arrows to navigate to the correct unit and press Enter to cycle through the unit options.

The "Show Unprocessed Data" option allows you to view any formatted data in its raw analog to digital count (ADC) state. When you check this option, all data readings on the main and data screens displays in an unprocessed format as seen on the following screen. This is helpful when troubleshooting sensors or when creating your own custom calibration. To save your changes, press Save. To cancel without saving, press Esc.
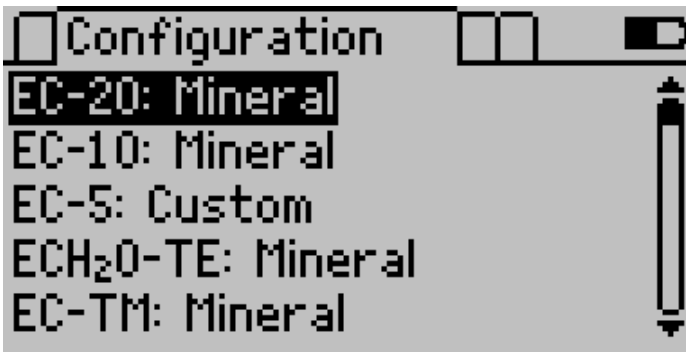
Calibration Type Sub Menu

Some sensors support a calibration adjustment for different media types (soil, rockwool, etc.). The first screen shows a summary of the selected soil calibrations for each configurable sensor.
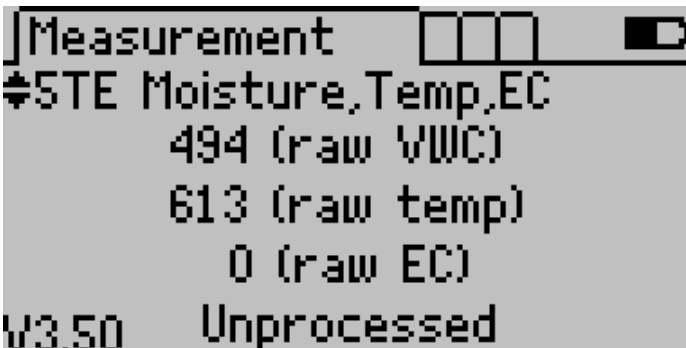
To modify the sensor calibration type, press Enter. You can choose a preset soil calibration type or create your own (See creating a Custom Calibration). To change the soil calibration type, select the medium option and press Enter. You can view the calibration coefficients by pressing Enter when the coefficients option is highlighted.

Press Save to save your calibration preference or press Esc to exit without saving changes.

```
┌─────────────────────────────────────┐
│ ☐Configuration    ☐☐      ▰▰▱ │
│ Sensor: 5TE                        ▲ │
│ ▉Medium: Mineral▉                  █ │
│ Coefficients...                    █ │
│                                    ▼ │
└─────────────────────────────────────┘
```
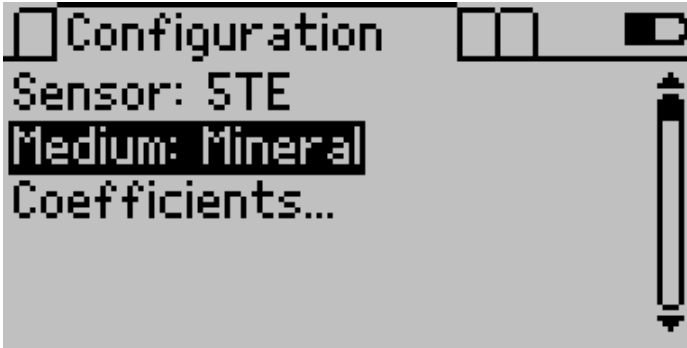
The following sensors support soil calibrations.

Table 1: Sensors Supporting Soil Calibration

Sensor Name	Supported Medium Calibrations
EC-5 Soil Moisture	Mineral, Potting/Peat, Rockwool and Custom
EC-10 Soil Moisture	Mineral and Custom
10HS Soil Moisture	Mineral and Custom
ECH2O-TE Moisture, Temp, & EC	Mineral, Potting/Peat, Rockwool, Perlite, and Custom
EC-TM Moisture & Temp	Mineral, Potting/Peat, Rockwool, Perlite and Custom
5TE Moisture, Temp & EC	Mineral, Potting/Peat, Rockwool, Perlite, and Custom
5TM Moisture & Temp	Mineral, Potting/Peat, Rockwool, Perlite, and Custom
GS1 Soil Moisture	Mineral, Potting/Peat, Perlite, Custom
GS3 Moisture, Temp & EC	Mineral and Soilless Substrate
RS3 Moisture, Temp & EC	Mineral and Soilless Substrate

Note: With the 5TE and 5TM sensors (only), custom calibration equations must be constructed with ε_a (dielectric permittivity) as the 'x' variable. With the ProCheck and other Keanley *data acquisition equipment, $\varepsilon_a = Raw/50$. With other data acquisition equipment, if read in SDI-12 mode, $\varepsilon_a = Raw/100$.*

3.2.1   Custom Calibrations

Creating a Custom Calibration

You can create your own custom calibration for certain sensor types. Custom calibrations apply directly to the raw analog to digital count (ADC) in the form of a fifth order polynomial. For more information on creating a custom calibration, please refer to the literature section of our website at www.keanley.com for the Custom Calibration Application Note.

Note: Custom calibrations are in terms of m^3/m^3. ProCheck applies unit conversions after the custom calibration.

Entering a Custom Calibration

To enter your custom calibration into the ProCheck, navigate to the Calibration Type Sub Menu (in the Configuration Menu) and select a sensor. Press Enter until the medium type says Custom. Then press Enter on the coefficient option to get to a summary screen like the one below.
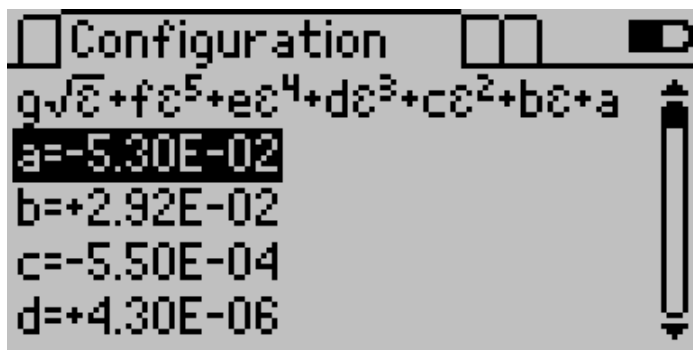
Each coefficient corresponds to a letter in the polynomial above. Below the polynomial resides the value of each coefficient in scientific notation. To edit a coefficient, press Enter while highlighting the coefficient. The Edit Screen appears to allow you to edit the coefficient.
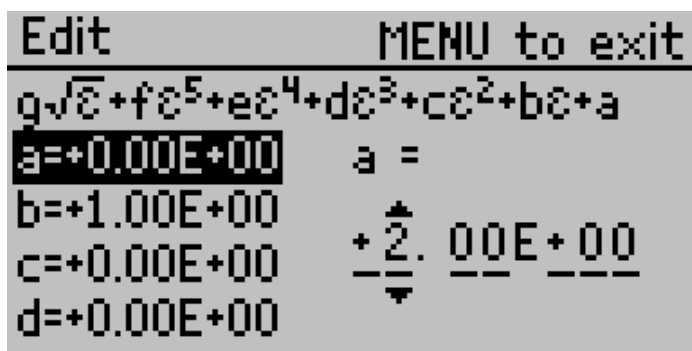
Use the arrow keys to change the current value, use the left and right arrow keys to change the cursor position.

Press Save to save the coefficient and Menu to return to the coefficient list without changing the coefficient.

Once you have changed all of the coefficients, press Save again to save the custom calibration or Esc to return to the Calibration Type Sub Menu without saving the calibration.

Sensor List Sub Menu

You can customize which sensors you would like available on your Main screen.
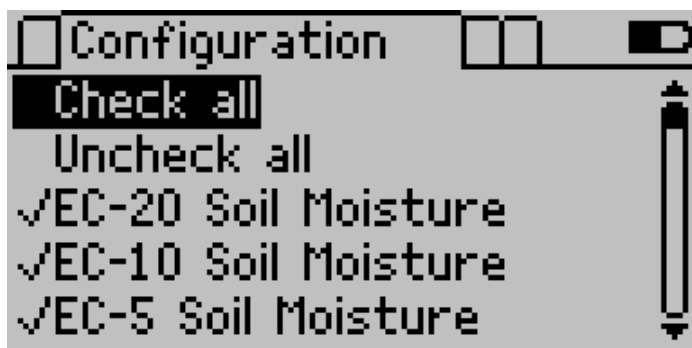
Navigate through the sensor list using'' arrows. To change the status of a sensor, highlight it and press Enter. Each sensor name you check

appears in the list on the Main screen. If it is unchecked it will excluded. You can use the "Check All" or "Un-check All" options to enable/disable all the sensors at once. Press Save to save your changes or press Esc to exit without saving.

3.3   SDI-12 Address Menu

Intro to SDI-12

SDI-12 stands for serial data interface at 1200 baud. This standard interfaces battery powered data recorders (loggers) with microprocessor based (intelligent) environmental data acquisition (EDA) sensors. Please see www.sdi-12.org for more information on using SDI-12.

Keanley's digital soil moisture sensors communicate using both the SDI-12 standard and Keanley proprietary protocol. This SDI-12 feature is not necessary when using Keanley sensors with Keanley data loggers. But, SDI-12 may be useful if you are using the sensors with other third party data acquisition systems such as Campbell Scientific data loggers.

For more information, refer to the sensor Integrator's Guide. One feature of the SDI-12 protocol is the use of a single character sensor address. This character may consist of "0" (default) to 1-9, a-z, or A-Z. This address is necessary when multiple sensors are installed at a single site. This is important because you will need to assign each sensor a different address to allow you to keep their data separate.

Setting SDI-12 addresses

You may use the ProCheck to conveniently assign SDI-12 addresses to the Keanley digital sensor. To assign the addresses, follow steps 1 through 5.

1. Use the pigtail adaptor to connect a SDI-12 compatible sensor to the ProCheck's stereo jack.

2. In the Configuration menu, select SDI-12 Address to refresh

the screen with the current sensor configuration.

```
┌─────────────────────────────────────┐
│ ☐Configuration   ☐☐     ◼▭│
│ Address:       ⬍2 » 3               │
│ Model:         5TE                  │
│ Model Ver:     3.50                 │
│ Vendor:        DECAGON              │
│ SDI-12 Ver:    1.3                  │
└─────────────────────────────────────┘
```
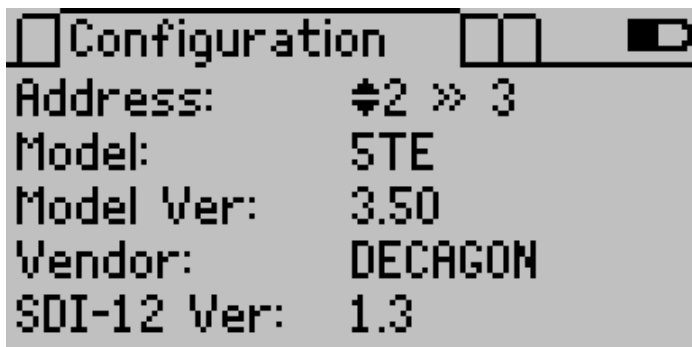
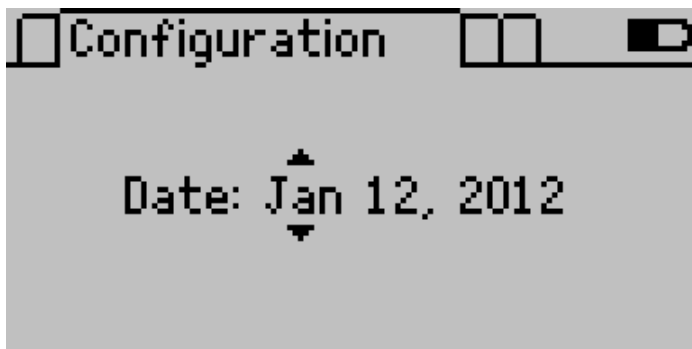3. Press the up and down arrows to select the new address from "0" (default) to 1-9, a-z, or A-Z.

4. Press Enter or Save to accept the new address. The screen refreshes to show the new address setting.

5. Press Esc or Menu to exit the SDI-12 Address Sub Menu.

Note: If you plan on setting addresses on multiple sensors, repeat the steps 1 through 4 before proceeding to step 5.

Date and Time Sub Menu

To set the date/time on the instrument you can connect to ECH2O Utility and select the "Set Date/Time" option under the Actions menu, or you can follow the instructions below to manually update the date and time.

```
┌─────────────────────────────────────┐
│ ☐Configuration   ☐☐     ◼▭│
│                                     │
│                  ▲                  │
│         Date: Jan 12, 2012          │
│                  ▼                  │
│                                     │
└─────────────────────────────────────┘
```

1. Scroll to the Date Option in the Configuration Menu and press Enter. You should see a screen similar to the one above. A pair of arrows is present above and below the first value.

2. Use the up and down arrow keys to change the current value. Press Enter to move to the next value or press Esc to return to the previous value. (Hold down the up/down arrows to scroll quickly).

3. Press Save to save your changes.

Contrast Sub Menu

The Contrast Sub Menu allows you to alter the screen lighting contrast settings. Scroll to the contrast option in the Configuration Menu press Enter. Use the arrows to change the contrast. Press Save to save the contrast or press Esc to exit without saving changes.
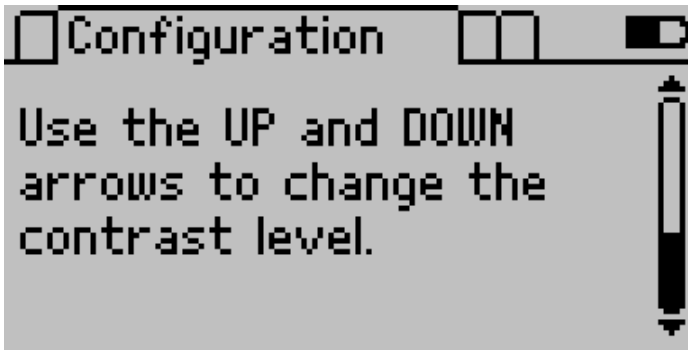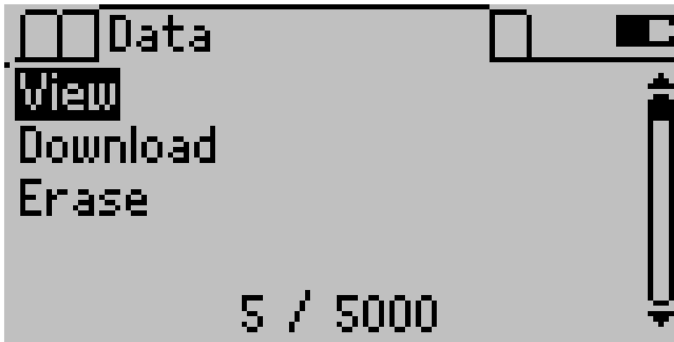

About Sub Menu

This menu displays the ProCheck serial number, device name, and firmware version.

3.4 The Data Menu

To navigate to the Data Menu, press Menu until the Data Tab is highlighted. Several different options are available within this menu. The ProCheck can store up to 5,000 individual readings.

Number of Readings Taken   Maximum Number of Readings

View Sub Menu

You can view a summary of your saved data or view detailed information about any data record. The first screen is a summary screen and looks similar to the picture below.
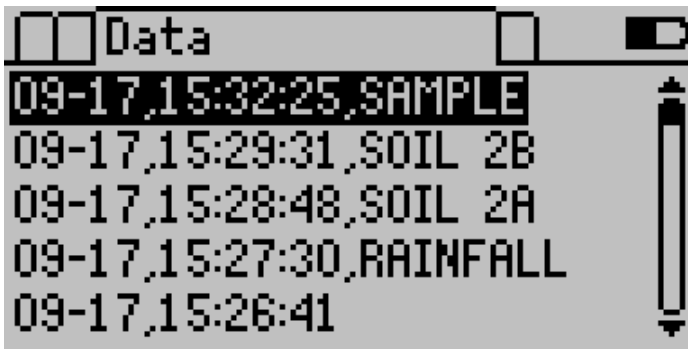
This page shows a data record list that includes the date and the time that the reading was taken and the annotation (if any). To view more information about an individual record, press Enter while highlighting the record.

The left side of the screen shows a reading summary and the right side shows the annotation, date, and time of the reading. From this screen you can press Esc to return to the previous view screen or use the up and down arrow keys to view more records in detail.

3.4.1   Statistics

You can collect summary statistics, including average and standard deviation, from measurements taken with the ProCheck. To collect summary statistics on a series of measurements, go to the Statistic menu.

Use the arrows to select the correct sensor. When you press Enter, the connected sensor will show you the current reading on the left hand side of the screen.

Each subsequent Enter keypress adds the current measurement to the summary statistics. The "n" value represents the number of measurements taken as part of the summary statistics. Press Esc once to stop live updating and press Esc a second time to reset the statistical information.

You can save the summary statistics by pressing the Save button. However, this does not reset the "n" value so you can continue to make measurements. The Save button only saves the summary statistics and not the data you use to calculate the values.

Downloading Data

Your ProCheck comes with ECH2O Utility software for Microsoft Windows. The Utility makes downloading data to your computer very easy. In general, you should use the ECH2O Utility to download data instead of the Menu option in the ProCheck.

*Note: You must install the USB driver before connecting the USB Cable to your computer. You can install the driver from the USB included with your ProCheck or download at www.*keanley*.com/support.*

This menu option sends the data saved in the ProCheck to the terminal software running on your computer.

1. Configure your terminal software with the following settings:

   9600 baud
   8 data bits, 1 stop bit, no parity
   No software/hardware flow control
   Append line feeds to incoming line ends

2. Connect your ProCheck to an available USB port on your computer using the included RS-232 to USB cable.

3. Set your terminal software to capture received data if you want to save the data.

4. Select "Download" from the ProCheck Data menu.

3.5   Erasing Data Memory

Caution: Once you activate this feature, all data is permanently deleted from the ProCheck, and is not coverable.

Follow steps 1 through 3 to erase your data.

1. Navigate to the Data Menu in the ProCheck.

2. Select the Erase option.

3. Press Enter on the Erase Data Memory screen.

4   ECH2O Utility Software

Use ECH2O Utility as a software interface for downloading sensor measurement data stored in your ProCheck. You can choose to save your data as an Excel Workbook file, tab-delimited text file, and a Raw, unprocessed data file. ECH2O Utility also helps you delete measurement data stored in your ProCheck and set the date and time in your ProCheck.

Note: Keanley *designed ECH2O Utility to work with your ProCheck and* Keanley*'s line of ECH2O loggers. Some non-applicable controls, features and settings of ECH2O Utility are disabled when connected to a ProCheck.*

Minimum computer requirements:

Windows 98 or newer, including Windows 7
Available serial port (or USB-to-serial adapter)
MS Excel 97 or newer (if saving data as XLS files)

4.1   Installation

The ECH2O Utility installer software is located on the USB that shipped with your ProCheck instrument.

You can also download the latest version of ECH2O Utility from Keanley's website: http://www.keanley.com/support/downloads.

*Note: You must install the USB driver before connecting the USB Cable to your computer. You can install from the USB drive included with your ProCheck or download at www.*keanley*.com/support.*

4.2   Connecting to your ProCheck

ECH2O Utility needs to establish a communication connection with your ProCheck to perform any of its functions.

Follow steps 1 through 4 to connect to your ProCheck.

1. Launch ECH2O Utility.

2. Use the supplied Serial to USB cable to physically connect your ProCheck to an available USB port on your computer.

3. Choose the correct USB (COM) port from the Connect Via control in the toolbar that matches the physical port you chose in step 2.

4. Click the Connect button in the toolbar.

Once ECH2O Utility establishes a connection with the ProCheck, you should see the ProCheck name, serial number, firmware version and date and time settings.

1. Connect ECH2O Utility to your ProCheck.

2. Click the Download button in the toolbar. You can also choose Download All Data from the Data Menu.

3. ECH2O Utility opens a standard File Save dialog. With this dialog, you can name your data file, select where to save on your computer, and choose a file format.

4. Click the dialog Save button to start the download. ECH2O Utility will show the progress of your download.

Note: You can cancel a download in progress using the Cancel button. ECH2O Utility does not create a data file if you cancel the download.

4.3   Saved Data File Types

By default, ECH2O Utility saves measurement data as an Excel Workbook file. Each of the file types are discussed below.

Excel Workbook (*.xls): ECH2O Utility saves your measurement data on Sheet 1 with these six columns.

- Measurement Time: Date and time when the ProCheck made the measurement.

- Sensor Name: Type of sensor used for the measurement.

- Measurement 1: Primary measurements made by the sensor.

- Measurement 2: Some sensors support two measurements.

- Measurement 3: Some sensors support three measurements.

- Sample ID: The optional annotation saved at the time of measurement.

ECH2O Utility saves the raw data for each measurement on Sheet 2. This information includes the calibration coefficients used to calculate your data (for applicable sensors).

You can use the raw data for the sensor to apply a different calibration. Sheet two has the following columns:

- Measurement Time: Date and time when the ProCheck made the measurement.

- Sensor Name: Type of sensor used for the measurement.

- Unprocessed 1: Raw data for measurement 1

- Unprocessed 2: Raw data for measurement 2.

- Unprocessed 3: Raw data for measurement 3.

- Sample ID: The optional annotation saved at the time of measurement.

- Calibration: The calibration used for soil moisture sensors.

- Coef a to Coef f: The calibration coefficients you use to calculate the measurement data.

- Processed Data Text File (tab delimited)(*.txt): This file format creates a tab delimited text file of your measurement data. This file type is useful if you do not have software that can read Excel files (this format does not contain any of the raw sensor data). The data appears in these columns.

- Measurement Time: Date and Time when the ProCheck made the measurement.

- Sensor Name: Type of sensor used for the measurement.

- Measurement 1: Primary measurement made by the sensor.

- Units 1: Units for measurement 1.

- Measurement 2: Some sensors support two measurements.

- Units 2: Units for measurement 2.

- Measurement 3: Some sensors support three measurements.

- Units 3: Units for Measurement 3.

- Sample ID: The optional annotation saved at the time of measurement.

- Raw File (comma delimited)(*.csv): This file format contains just the raw data the ProCheck stores. Save this type of file if you need to send a raw file to Keanley to help in troubleshoot-ing a data processing problem.

4.4   Data File Options

ECH2O Utility has several user preference options that help you control how your data files. These options only apply to the Excel Workbook and Processed Data Text file formats. To change these options, open the ECH2O Utility preferences by choosing Preferences from the Edit menu.

- Measurement Units: You can choose the units ECH2O Utility uses to present your data. For example, you can choose °C or °F for temperature measurements. Use the Measurement tab to set your preferred units. Data units for data files come from ECH2O Utility preferences, not the ProCheck settings.

- Column Headers: By default, ECH2O Utility writes column headers to your data file. You can turn this feature off by unselecting this option in the Data File tab of the ECH2O Utility Preferences.

- Date and Time Formatting in Data Files: ECH2O Utility uses the Windows operating system settings for formatting date

and time information (Regional & Language Options control panel). You can override this formatting in the Data File tab of the ECH2O Utility Preferences.

4.5   More ECH2O Utility Options

In addition to downloading data stored in your ProCheck, ECH2O Utility helps you manage your ProCheck with the following options.

Setting the Date and Time

ECH2O Utility automatically synchronizes the date and time of your ProCheck to your computer time when you connect to your ProCheck. You can manually synchronize the time by selecting Set Date/Time from the Action menu.

4.6   Test Device Firmware

If you think your ProCheck is not operating correctly, you can check the integrity of the firmware in your ProCheck. Firmware is the embedded software that controls how your ProCheck functions. First, establish a connection to your ProCheck then choose Test Device Firmware from the Device Tools Sub Menu in the Actions menu. Contact Keanley or your Keanley representative if your firmware has become corrupt.

4.7   Check for Device Firmware Updates

You can use ECH2O Utility to check for updates to your ProCheck firmware. Choose Check for Device Firmware Updates from the Help menu to compare the firmware version in your ProCheck with the latest version available from Keanley. Your computer must be connected to the Internet for this feature to work. Keanley can improve your ProCheck by publishing new versions of firmware to fix bugs or add features.

5   Troubleshooting and Repair

This chapter is in two sections. The first section is troubleshooting ideas for resolving issues when using your ProCheck. The second section is for troubleshooting software issues with ECH2O Utility.

Table 2: Troubleshooting Quick Guide

If this problem occurs:	Refer to:
Troubleshooting the ProCheck	
ProCheck does not power on	Problem #1
ProCheck does not read Sensors	Problem #2
ProCheck is not returning accurate readings	Problem #3
Troubleshooting ProCheck Readings	Problem #4
ProCheck reports readings are above or below range	
ProCheck reports Invalid or No Response	Problem #5
ProCheck returns inaccurate data	Problem #6
Troubleshooting Serial Connections	
ECH2O Utility says COM port busy	Problem #7
USB-to-Serial adapter not showing in Com Port picker	Problem #8
ECH2O Utility cannot connect to ProCheck	Problem #9
ECH2O Utility reports it lost connection with device	Problem #10
ECH2O Utility reports no data to download	Problem #11
ProCheck data file shows "* * *"	Problem #12
Sensor data is incorrect	Problem #13
Sensor data is incorrect	Problem #12

Troubleshooting the ProCheck

To ensure operation of your ProCheck, please consider these helpful steps.

1. PROBLEM:
ProCheck does not have power.

SOLUTION

Batteries: Be sure your ProCheck has sufficient battery power. The ProCheck screen shows a battery icon in the upper right corner. When the battery power is low, replace the batteries. You can also use ECH2O Utility to check your battery power. Make sure you insert the batteries in the correct orientation when replacing them.

2. PROBLEM:
SOLUTION

Sensors Plugged Securely: Check that your sensor connector is fully engaged with the connector on the ProCheck.

3. PROBLEM:
ProCheck is not returning accurate readings.

SOLUTION

Be sure to select the correct sensor from the sensor menu on the main screen. Making measurements with an incorrect sensor type selected will create incorrect measurements.

Troubleshooting ProCheck Readings

4. PROBLEM:
My ProCheck display reads "Above Range" or "Below Range."

SOLUTION

The ProCheck reads a value below or above the expected value for the sensor. Check to make sure the sensor is plugged in and you chose the correct sensor type. This message could also indicate a broken sensor. Contact Keanley for assistance.

5. PROBLEM
My ProCheck says "Invalid Response" or "No Response" on the display.

SOLUTION

The ProCheck cannot communicate with a digital sensor. Check to make sure the sensor is plugged in and you selected the correct sensor type. Try pressing the Enter button several times to restart the sensor measurement. If these steps fail, the sensor is probably broken, contact Keanley for repair or replacement.

6. PROBLEM
The data shown for my ProCheck seems incorrect.

SOLUTION

If you are using a custom calibration, be sure you entered the correct coefficients in the Sensor Configuration menu. Check to make sure the sensor type on the Main screen matches the sensor type plugged into the ProCheck. If these steps do not resolve the problem, please consult the sensor Operator's manual.

Troubleshooting Serial Connections

7. PROBLEM
The ECH2O Utility tells me the communication port is in use by another application, but no other programs are running.

SOLUTION

Some PDA synchronization programs monitor serial communication ports. Disable Microsoft's ActiveSync or Palm's HotSync system software when using ECH2O Utility on a serial port.

5. PROBLEM
My USB-to-Serial adapter does not show in the communication port picker.

SOLUTION

Enable "Force find all Communication Ports" in the Preferences Menu by going to the Edit Menu, clicking Preferences, then the Communication tab, and enabling the check box at the bottom of the screen. Enabling this option may find other serial ports unavailable for use by the ECH2O Utility (i.e. modems installed in your computer).

8. PROBLEM
ECH2O Utility tells me it can not connect to my ProCheck.

SOLUTION

Try one or more of the following to make sure there is a serial connection to your ProCheck.

- Check your serial port choice. Make sure the "Connect Via" drop-down menu shows the name of the seProCheck

- Troubleshoot serial port to physically connect to your ProCheck. For example, if your ProCheck is physically connected to COM1, the "Connect Via" control should be set to "Direct on COM1 Communication Port."

- Check that your serial cable is securely plugged into your ProCheck and your computer.

- Make sure your ProCheck has good batteries.

9. PROBLEM
ECH2O Utility loses connection with my device.

SOLUTION

Please check or replace your serial cables. You can also increase the number of times ECH2O Utility tries sending commands to the ProCheck or DataStation. Also, increase the Direct Connect Retries on the Communication tab of the Preferences form.

Troubleshooting Data Issues

10. PROBLEM
ECH2O Utility tells me there is no data available for download.

SOLUTION

There is no measurement data stored in your ProCheck or your previously saved data was erased. To use measurement data collected by the ProCheck on your computer. Be sure to press the Save button on the ProCheck after each measurement to save data for later use.

11. PROBLEM
Some of the measurement data in my ProCheck data file shows "* * *."

SOLUTION

The three asterisks means the data stored by the ProCheck is outside the expected range for the sensor type. This could indicate a broken sensor or inaccurate sensor type selection.

12. PROBLEM
My sensor data does not seem correct.

SOLUTION

There are many issues that impact the quality of sensor measurements. Please see the sensor Operator's manual for help troubleshooting the sensor.

5.1   Repair

Repair Instructions

If your ProCheck should ever require servicing contact support@keanley.com. We need your address, phone number, and your ProCheck serial number.

Before shipping your instrument to Keanley, please contact Keanley

to obtain a Return Merchandise Authorization (RMA) number. This allows Keanley's repair staff to keep track of your ProCheck. Once you have acquired an RMA, send your ProCheck to Keanley. Please include a document listing the complete shipping address, name, and department of the person responsible for the instrument, as well as a description of the problem. This helps our technicians and shipping department to expedite servicing on your ProCheck.

Please pack your ProCheck carefully. Ship it back in the carrying case, preferably inside a cardboard box. Ship to:

Repair Costs

Keanley repairs products with manufacturer's defects and those under warranty at no cost to the customer. For non-warranty repairs, we bill the customer for the cost of parts, labor, and shipping.

6   Appendix A

6.1   Compatible Sensors

The ProCheck is only compatible with sensors made by Keanley. This appendix gives a list of compatible sensors.

To learn more about individual sensors and their respective calibrations, please visit http://www.keanley.com/support.

Soil Water Content Sensors

10HS, EC-5, GS1 High Frequency Soil Moisture
5TM Soil Moisture and Soil Temperature
5TE, GS3, RS3 Soil Moisture, Soil Temperature, Soil EC

Soil Water Potential Sensors

MPS-2, MPS-6 Water Potential and Temperature
LWS Leaf Wetness

Temperature Sensors
ECT Air Temperature
RT-1 Rugged Soil Temperature

Rain Gauges

ECRN-50 Low Resolution Rain Gauge
ECRN-100 High Resolution Rain Gauge
Temperature and Relative Humidity
VP-3 Temp, Relative Humidity, and Vapor Pressure

Radiation Sensors

PYR Solar Radiation
QSO-S PAR Photon Flux
SRS-Ni, SRS-Nr, SRS-Pi, SRS-Pr Solar Reflectance

Wind Sensor

Davis Cup Anemometer
DS-2 Sonic Anemometer
G2/G3 Drain Gauge
Irrigation Switch
PS-1 Pressure Switch

Water Level Sensors

Drain Gauge G3, Deep Drainage, Temperature, and Electrical Conductivity
CTD-5, Water Level, Temperature, and Electrical Conductivity
CTD-10, Water Level, Temperature, and Electrical Conductivity
CTD, Water Level, Temperature, and Electrical Conductivity

Miscellaneous Sensors

ECRN-50 Volume
Millivolt (0-3000 mV input)
Millivolt (0-1500 mV input)
Pulse Counter
Flow Meter
ES-2, ES-2F Electrical Conductivity and Temp
Leaf Wetness Sensor

Discontinued Sensors

EC-10, EC-20 Classic Soil Moisture
EC-TM Soil Moisture and Temperature
ECH2O-TE Soil Moisture, Soil Temperature, Soil EC
MPS-1 Dielectric Water Potential
EHT Temperature/RH Sensor

7 Appendix B

7.1 Sending Feedback

Keanley Software makes it easy to send feedback, bug reports, and feature requests to Keanley or your Keanley Distributor. Choose "Send Feedback to Keanley..." from the Help menu. This opens the Send Feedback to Keanley window.

Figure 1: Send Feedback

Enter your name, company name, and other contact information. Tell us what type of feedback you are sending (General Feedback, Feature Suggestions, Bug Report, or Other). Indicate how you want us to respond to your feedback (E-mail or Telephone).

Use the description area to give details for your feedback. If you are reporting a bug, it is very helpful for you to tell us what steps you took for the bug to happen and any error message you saw. By default, bug reports also include the software error files.

You can send Keanley a file using this form too. This is useful for sending data files that you have questions about. If you work directly with a Keanley representative, put their E-mail address in the field at the bottom of the form.

This sends the contents of the form to them. Your Keanley representative can follow-up with you directly.

8 Declaration of Conformity

Application of Council Directive: 2004/108/EC and 2011/65/EU

Standards to which conformity is
declared: EN 61326-1:2013 and

EN 50581:2012

ProCheck

Type of Equipment:

PC-1

Model Number:

2007

Year of First Manufacture:

The undersigned hereby declares on behalf of Keanley, that the above referenced products, to which this declaration relates, fully conform to the provisions of the Council Directives and stan-dards referenced above.

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