CaTeC

ProCheck

Operator's Manual
Version 1.0

ProCheck

MENU   SAVE

ESC   ENTER

DECAGON DEVICES

Decagon Devices, Inc.

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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 (the results of ordinary wear and tear, neglect, misuse, accident and excessive deterioration due to corrosion from any cause are not considered to be a defect); but Seller's liability for defective parts shall, in no event, exceed the furnishing of replacement parts f.o.b. the factory where originally manufactured. Material and equipment covered hereby which is not manufactured by the Seller shall be covered only by the warranty of its manufacturer. Seller shall not be liable to Buyer for loss, damage, or injury 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, non-use, 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 constitute's 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 not without limitation, the implied warranties of merchantability and fitness for a particular purpose), not expressly set forth herein.

1. Introduction

Thank you for purchasing Decagon Devices' ProCheck. The ProCheck is a device used to interface with your analog and digital soil moisture sensors and obtain instantaneous results. This manual will help you understand the functions of and get the most out of your ProCheck device.

Customer Service and Tech Support

When contacting us via fax or E-mail, include your ProCheck serial number and firmware version, your name, address, phone and fax numbers, and a description of your problem.

Contact Information

PHONE:
United States/Canada (Toll Free) **1-800-755-2751**.
Outside of the U.S./Canada: **1-509-332-2756**.
FAX **1-509-332-5158**
E-Mail **soils@decagon.com**
You can also send feedback to Decagon using ECH_2O Utility "Send Feedback to Decagon" feature. See Appendix B for more information.

Warranty
The ProCheck is covered by a standard, one-year warranty on parts and labor, and is activated upon the arrival of the instrument at your location.

Repair Instructions

If your ProCheck should ever require a repair, call Decagon at (509)-332-2756 or 1-800-755-2751 (United States and Canada). We will ask you for your address, phone number, and your ProCheck serial number. For non-warranty repairs, we will also ask for your method of payment.

Before shipping your instrument to Decagon, please contact Decagon to obtain a Return Merchandise Authorization number (RMA). This will allow Decagon's repair staff to keep track of your ProCheck. Once you have acquired an RMA, send your ProCheck to Decagon. 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 will better help our technicians and shipping department to expedite repair on your ProCheck, and ship it back to you.

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

Decagon Devices, Inc.
2365 NE Hopkins Court
Pullman, WA 99163

Repair Costs

Manufacturer's defects and instruments under warranty
will be repaired at no cost. For non-warranty repairs, costs
for parts, labor, and shipping will be billed to you.

2. About the ProCheck

The ProCheck is a hand-held readout device designed for use with all soil moisture sensors and environmental monitoring sensors made or sold by Decagon.

Specifications

Accuracy: Determined by the sensor being used

Battery Type: 4 AA

Battery Life: 500-1000 Hours Expected

Connector Type: Stereo Plug (3.5mm)

Memory: 5000 individual readings
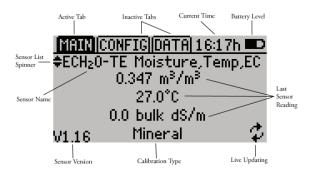
Components
- ProCheck Hand-held reader
- Serial Cable
- Manual

3. The Buttons

⏻ **MENU**	**MENU** is used to turn on the ProCheck and cycle through the menus at the top of the screen. Holding **MENU** down for 3 seconds will turn the power off. Pressing **MENU** in an annotation/edit screen will return to the previous screen.
SAVE	**SAVE** is used to save setting changes to the instrument and annotate readings.
ENTER	**ENTER** is used to choose options within menus, start readings, and scroll to the right in an annotation/edit menu.
ESC	**ESC** is used to cancel setting changes, cancel readings, and scroll to the left in an annotation/edit menu.
△ ▽	The UP and DOWN arrows are used to scroll through sensors and menu options, as well as change characters and numbers in the annotate/edit menus.

4. The Menus

The Main Menu

The ProCheck features three main menus designed for ease of use. The ProCheck displays the Main Menu when first powered on. This menu is used for taking the measurements with Decagon's sensors.

Changing Your Sensor

You can change your 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 Config. Menu. The sensor version is only shown if the ProCheck was able to retrieve sensor information directly from the sensor. A soil calibration type is displayed 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 start the live update mode. A live up-dating icon is displayed in the lower right corner. The ProCheck will continuously update 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. From the save screen you may annotate your reading.

Annotating a Reading

Once you have taken a reading, press **SAVE** to show the annotation 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 the read-ing was taken.

```
 ANNOTATE       MENU to exit
 ECH₂O-TE Moisture,Temp,EC
 0.181 m³/m³
      25.4°C    SAMPLE
                ‾‾‾‾‾‾‾‾‾
 0.0 bulk dS/m Sep 17, 2007
      Mineral     15:32:25h
```

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 will remember the last annotation stored into memory. You can clear all or part of an old annotation by pressing the up or down arrow key. This will clear all the characters to the right of the current cursor position.

The Config Menu

To navigate to the Config Menu, press **MENU** until the Config tab is highlighted. Several different options are available for customizing the instrument.
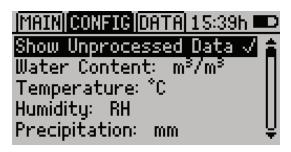
Units Sub Menu

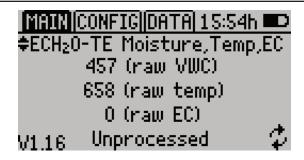From this menu you can configure your unit preferences for various unit types.

```
┌─────────────────────────────────┐
│ MAIN CONFIG DATA 15:39h ▭D     │
│ Show Unprocessed Data ✓ ▲       │
│ Water Content:  m³/m³           │
│ Temperature: °C                 │
│ Humidity:  RH                   │
│ Precipitation:  mm  ▼           │
└─────────────────────────────────┘
```

Use the up and down arrows to navigate to the unit you would like to change and press **ENTER** to cycle through the different types.

The "Show Unprocessed Data" option allows you to view any formatted data in its raw analog to digital count (ADC) state instead. When this option is checked, all data readings on the main and data screens are displayed in an unprocessed format as seen on the following screen. This can be helpful when troubleshooting sensors or when creating your own custom calibration. To save your changes, press **SAVE**. To cancel without saving, press **ESC**.

```
┌─────────────────────────────────┐
│ MAIN CONFIG DATA 15:54h ▪▭     │
│ ⬍ECH₂O-TE Moisture,Temp,EC     │
│        457 (raw VWC)            │
│        658 (raw temp)           │
│          0 (raw EC)             │
│ V1.16  Unprocessed        ⟳    │
└─────────────────────────────────┘
```
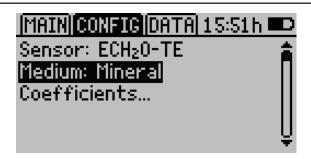
Calibration Type Sub Menu

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.

```
┌─────────────────────────────────┐
│ MAIN CONFIG DATA 15:49h ▪▭     │
│ EC-20: Mineral            ▲    │
│ EC-10: Mineral                 │
│ EC-5: Mineral                  │
│ ECH₂O-TE: Mineral              │
│ EC-TM: Mineral            ▼    │
└─────────────────────────────────┘
```

To modify a sensor's 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, press **ENTER** when the medium option is selected. 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.

Below is a list of sensors that support soil calibrations.

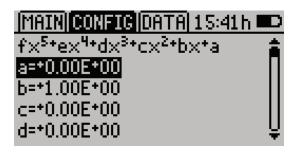| Sensor Name	Supported Medium Calibrations
EC-20 Soil Moisture	Mineral, Custom
EC-10 Soil Moisture	Mineral, Custom
10 HS Soil Moisture	Mineral, Custom
EC-5 Soil Moisture	Mineral, potting, Rockwool, Perlite, Custom
ECH_2O-TE Moisture, Temp, EC	Mineral, Potting, Rockwool, Perlite, Custom
EC-TM Moisture, Temp	Mineral, Potting, Rockwool, Perlite, Custom

Creating a Custom Calibration

You can create your own custom calibration for certain sensor types. A custom calibration is applied directly to the raw analog to digital count (ADC) in the form of a fifth order polynomial. If you would like to purchase a custom calibration type or create your own, visit our ECH_2O calibration support page for more information.

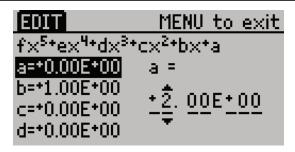http://www.decagon.com/ECH2O/calibration

NOTE: Custom calibrations are in terms of m³/m³. Unit conversions are applied after the custom calibration is applied.

Entering a Custom Calibration

To enter your custom calibration into the ProCheck, navigate to the Calibration Type sub menu (in the Config 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 is the value of each coefficient in scientific notation. To edit a coefficient, press **ENTER** when the desired coefficient is highlighted. You will see a screen like the one below.

```
EDIT               MENU to exit
fx⁵+ex⁴+dx³+cx²+bx+a
a=+0.00E+00    a =
b=+1.00E+00      ▲
c=+0.00E+00    +2. 00E+00
d=+0.00E+00      ▼
```
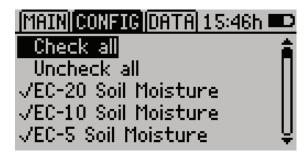
Use the up and down arrow keys to change the current value and use the left and right arrow keys to change the cursor position. Press **SAVE** to save the coefficient and **MENU** to return to the coefficient list without changing the coefficient.

Once you've 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 here.

```
MAIN CONFIG DATA 15:46h ▐▌
 Check all                    ▲
 Uncheck all
✓EC-20 Soil Moisture
✓EC-10 Soil Moisture
✓EC-5 Soil Moisture          ▼
```

Navigate through the sensor list using the up and down arrows. To change the status of a sensor, highlight it and press **ENTER**. If the sensor name is checked, it will be included in the list on the main screen. If it is unchecked it will be 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.

Date and Time Sub Menu

To set the date/time on the instrument you can connect to ECH_2O 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:

1. Scroll to the Date Option in the Config Menu and press **ENTER**. You should see a screen similar to the one above. A pair of arrows will be 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
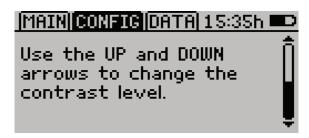
up/down arrows to scroll quickly).

3. Press **SAVE** to save your changes.

Contrast Sub Menu

This menu allows you to alter the screen lighting contrast settings. Scroll to the contrast option in the Config Menu press **ENTER**.
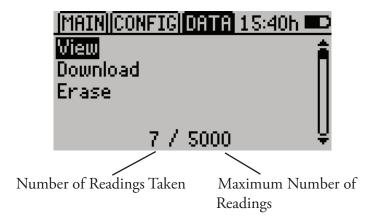

Use the up and down arrows to change the contrast. Press **SAVE** to save the contrast or press **ESC** to exit without saving changes.

About Sub Menu

This menu displays your ProCheck's serial number, device name and firmware version.
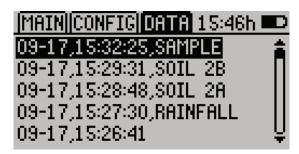
The Data Menu

To navigate to the Data Menu, press **MENU** until the Data Tab is highlighted. Several different options are available within this menu. With the ProCheck you can store up to 5000 individual readings.

Number of Readings Taken   Maximum Number of Readings
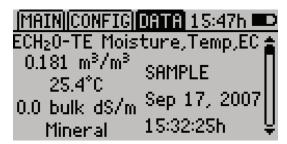
View Sub Menu

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 that record is highlighted. (See screen below).

```
MAIN CONFIG DATA 15:47h
ECH₂O-TE Moisture,Temp,EC
  0.181 m³/m³
      25.4°C        SAMPLE
0.0 bulk dS/m   Sep 17, 2007
    Mineral       15:32:25h
```

The left side of the screen shows a reading summary and the right side shows the annotation, date, and time that the reading was taken. 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

Downloading Data

Your ProCheck comes with ECH$_2$O Utility software for Microsoft Windows. The Utility makes downloading data to your computer very easy. In general, you should use the ECH$_2$O Utility to download data instead of the menu option in the ProCheck.

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 serial port on your computer using the included RS-232 serial cable.

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

4. Select "Download" from the Data Menu of the ProCheck.

Erasing Data Memory

WARNING! Once this feature is activated, all data will be permanently deleted from the ProCheck, and cannot be recovered.

To erase your data, do the following.

1. Navigate to the Data Menu in the ProCheck.

2. Select the Erase option.

3. Press **ENTER** on the Erase Data Memory screen.

5. ECH$_2$O Utility Software

ECH$_2$O Utility is the software interface for downloading sensor measurment 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. ECH$_2$O Utility also helps you delete measurement data stored in your ProCheck and set the date and time in your ProCheck.

NOTE: ECH$_2$O Utility is designed to work with your ProCheck and Decagon's line of ECH$_2$O loggers. Some of the controls, features and settings of ECH$_2$O Utility are disabled when connected to a ProCheck because they don't apply to your ProCheck.

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

Installation
The ECH$_2$O Utility installer software is located on the CD-ROM that shipped with your ProCheck instrument. You can also download the latest version of ECH$_2$O Utility from Decagon's website: http://www.decagon.com/ech2o/software.

Connecting to your ProCheck
ECH$_2$O Utility needs to establish a communication connection with your ProCheck to perform any of its func-

tions. To connect to your ProCheck, do the following:

1. Launch ECH$_2$O Utility.

2. Use the supplied RS232 serial cable to physically con-
    nect your ProCheck to an available serial (COM) port
    on your computer. If your computer doesn't have an
    available serial port, you can use an USB-to-serial
    adapter.

3. Choose the correct serial (COM) port from the Con-
    nect Via control in the toolbar that matches the physi-
    cal port you chose in step 2.

4. Click the Connect button in the toolbar.

*NOTE: if you receive an error tyring to connect to your
ProCheck, please check your serial port choice. Please also see
Chapter 6: Troubleshooting for more serial port help.*

Once ECH$_2$O Utility establishjes a connection with the
ProCheck, you should see the ProCheck's name, serial
number, firmware version and date & timesettings.

1. Connect ECH$_2$O Utility to your ProCheck.

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

3. ECH$_2$O Utility opens a standard File Save dialog. With
    this dialog, you can name your data file, select where
    it will be saved on your computer, and choose a file

format for the saved data.

4. Click the dialog's *Save* button to start the download. ECH$_2$O Utility will show the progress of your download.

NOTE: You can cancel a download in progress using the Cancel button. ECH$_2$O Utility doesn't create a data file if you cancel the download.

Saved Data Filetypes

By default, ECH$_2$O Utility saves measurement data as an Excel Workbook file. Each of the file types are discussed below.

Excel Workbook (*.xls): ECH$_2$O Utility saves your measurement data on Sheet 1 with the following 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.

ECH$_2$O Utility saves the raw data for each measurement on Sheet 2. This information includes the calibration co-

efficients used to calculate your data (for applicable sensors). You can use the raw data for the sensor to apply a different calibration if needed. This sheet 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 used 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 don't have software that can read Excel files (this format does not contain any of the raw sensor data). The data are organized in the following 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 measure

ments.
• **Units 2**: Units for measurement 2.
• **Measurement 3**: Some sensors support three mea
surements.
• **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 as stored by the ProCheck. Save this type of file if you need to send a raw file to Decagon to help in troubleshooting a data processing problem.

Data File Options

ECH$_2$O Utility has several user preference options that help you control how your data files are created. These options only apply to the Excel Workbook and Processed Data Text file formats. To change these options, open the ECH$_2$O Utility preferences by choosing *Preferences* from the *Edit* menu.

Measurement Units: You can choose the units ECH$_2$O 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 ECH$_2$O Utility preferences, not the ProCheck settings.

Column Headers: By default, ECH$_2$O Utility writes column headers to your data file. You can turn this feature off by deselecting this option in the *Data File* tab of the ECH$_2$O Utility Preferences.

Date and Time Formatting in Data Files: ECH$_2$O 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 ECH$_2$O Utility Preferences.

More ECH$_2$O Utility Options

In addition to downloading data stored in your ProCheck, ECH$_2$O Utility helps you manage your ProCheck with the following options.

Setting the Date and Time

ECH$_2$O 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.

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 Decagon or your Decagon representative if your firmware has become corrupt.

Check for Device Firmware Updates

You can use ECH$_2$O 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 Decagon. Your computer must be connected to the internet for this feature to work. Decagon can improve your ProCheck by publishing new versions of firmware to fix bugs or add features.

6. Troubleshooting

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 ECH$_2$O Utility issues.

Troubleshooting the ProCheck

To ensure operation of your ProCheck, please consider the following:

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 ECH$_2$O Utility to check your battery power. Make sure you insert the batteries in the correct orientation when replacing them.

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

Correct Sensor Type: 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

PROBLEM: My ProCheck says "Above Range or "Below Range" in the display.

SOLUTION: The ProCheck is reading a value below (or above) the expected value for the sensor. This could indicate a broken sensor. Check to make sure the sensor is fully plugged in and the correct sensor type is chosen in the sensor menu.

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

SOLUTION: The ProCheck is unable to communicate with a digital sensor. Check to make sure the sensor is fully plugged in and the correct sensor type is chosen in the sensor menu. Try pressing the **ENTER** button several times to restart the sensor measurement. If these steps fail, the sensor is probably broken.

PROBLEM: The data shown for my ProCheck doesn't seem correct.

SOLUTION: If you are using a custom calibration, be sure that the coefficients are properly entered in the sensor configure menu. Check to make sure the sensor type shown in the sensor menu on the main screen matches the sensor type plugged into the ProCheck. If these steps don't resolve the problem, please consult the sensor's user manual for more information.

Troubleshooting ECH$_2$O Utility

Troubleshooting Serial Connections

PROBLEM: The ECH$_2$O Utility tells me the communication port I want to use is in use by another application, but I don't think any other programs are running.

SOLUTION: Some PDA synchronization programs monitor serial communication ports. Disable Microsoft's ActiveSync or Palm's HotSync system software while trying to use the serial port with the ECH$_2$O Utility.

PROBLEM: My USB-to-Serial adapter is not showing 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 that are not available for use by the ECH$_2$O Utility (for example, modems installed in your computer).

PROBLEM: ECH$_2$O Utility tells me it can't connect to my ProCheck.

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

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

rial port you are using 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.

PROBLEM: ECH$_2$O Utility keeps reporting it lost the connection to my device.

SOLUTION: Please check or replace your serial cables. You can also increase the number of times ECH$_2$O Utility tries sending commands to the ProCheck or DataStation. Increase the Direct Connect Retries on the Communication tab of the Preferences form.

Troubleshooting Data Issues

PROBLEM: ECH$_2$O Utility tells me there is no data for downloading.

SOLUTION: There is no measurement data stored in your ProCheck or previously saved data was erased. If you want to use measurement data collected by the ProCheck on your computer, be sure to press the **SAVE** button on the ProCheck after each measurement.

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.

PROBLEM: My sensor data doesn't seem correct.

SOLUTION: There are many issues that affect the quality of the sensor measurement. Please see the user manual for your particular sensor for help troubleshooting the data collected by your sensor.

Appendix A:

Compatible Sensors

Decagon designed the ProCheck to provide a simple measurement interface for the ECH_2O soil moisture sensor family. You can easily make and record instantaneous sensor measurements with the ProCheck.

The ProCheck is also useful when installing and troubleshooting sensors used with the ECH_2O loggers. For this reason, the ProCheck will measure all the sensors used in the ECH_2O system.

NOTE: The ProCheck is only compatible with sensors made and sold by Decagon Devices for the ECH_2O system.

Soil Moisture Sensors
The ProCheck supports using the ECH_2O volumetric water content sensor in different types of growth media. The following table lists the supported calibrations for each type of sensor.

Sensor Name	Supported Medium Calibrations
EC-20 Soil Moisture	Mineral, Custom
EC-10 Soil Moisture	Mineral, Custom
10 HS Soil Moisture	Mineral, Custom
EC-5 Soil Moisture	Mineral, potting, Rockwool, Perlite, Custom
ECH_2O-TE Moisture, Temp, EC	Mineral, Potting, Rockwool, Perlite, Custom
EC-TM Moisture, Temp	Mineral, Potting, Rockwool, Perlite, Custom

Please see your sensor user manual for more information on medium-specific and custom calibrations.

Analog Sensors

The ProCheck is also compatible with the following ECH_2O system analog sensors:
- MPS-1 Water Potential
- ECT Temperature
- PYR Solar Radiation
- QSO-S PAR Photon Flux
- Millivolt

Rain Gauge Sensors

The ProCheck will count tips from the following rain gauge sensors. This is helpful for troubleshooting rain gauge problems.
- ECRN-50 Precipitation
- ECRN-50 Volume
- ECRN-100 Precipitation

NOTE: The ProCheck is not compatible with the ECRN Precipitation rain gauge used with Em5 loggers.

Digital Sensor

The ProCheck also displays and stores data collected by the following digital sensor:
- EHT RH/TEMP (temperature and relative humidity)

Special Sensors

The following sensors are treated as special cases for the ProCheck. When an ECH_2O logger measures these sensors. It uses a time-series date to make each measurement.

The ProCheck can only take instantaneous measurements so the data measured by the ProCheck is different from a logger.

- G1 Drain Gauge shows the percent full of the tip reservoir.
- ELW Leaf Wetness shows the wetness status.
- Pressure Switch shows if the switch is open or shut.

NOTE: Decagon will release firmware updates for the ProCheck to support any future ECH$_2$O system sensors compatible with the ProCheck. These are available on Decagon's website at www.decagon.com/updaters, and can be installed by the end user.

Appendix B:

Send Feedback to Decagon

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

Enter your name, company name, and other contact in-formation. 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 feed-back (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. Be default, bug reports also include the software error files.

You can send Decagon a file using this form too. This is useful for sending data files that you have questions about.

If you work directly with a Decagon 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 Decagon representative can follow-up with you directly.

ProCheck CE Compliance

DECLARATION OF CONFORMITY

Application of Council Directive: 89/336/EEC

Standards to Which Conformity is EN61326 : 1998
Declared: EN55022 : 1998

Manufacturer's Name: Decagon Devices, Inc.

Type of Equipment: ProCheck

Model Number: PC-1

Year of First Manufacture: 2007

This is to certify that the ProCheck, manufactured by Decagon Devices, Inc., a corporation based in Pullman, Washington, USA, meets or exceeds the standards for CE compliance as per the Council Directives noted above. All instruments are built at the factory at Decagon and pertinent testing documentation is freely available for verification.

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