

**PCONNECTCE FOR POCKET PC HANDHELD  
SOFTWARE SUPPORT FOR CAMPBELL SCIENTIFIC DATALOGGERS**

**VERSION 1.1**

**INSTRUCTION MANUAL**

**REVISION: 8/03**

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## **CAMPBELL SCIENTIFIC, INC.**

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815 W. 1800 N.  
Logan, UT 84321-1784  
USA  
Phone (435) 753-2342  
FAX (435) 750-9540  
[www.campbellsci.com](http://www.campbellsci.com)

Campbell Scientific Canada Corp.  
11564 -149th Street  
Edmonton, Alberta T5M 1W7  
CANADA  
Phone (780) 454-2505  
FAX (780) 454-2655

Campbell Scientific Ltd.  
Campbell Park  
80 Hathern Road  
Shepshed, Loughborough  
LE12 9GX, U.K.  
Phone +44 (0) 1509 601141  
FAX +44 (0) 1509 601091

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# ***PConnectCE for the Pocket PC Handhelds***<sup>1</sup>

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## **1. Introduction**

Welcome to *PConnectCE for Pocket PC Handhelds* support software for Campbell Scientific's CR10(X), CR500/510, CR23X, 21X, and CR7 dataloggers.

*PConnectCE* software allows you to connect your Pocket PC handheld to a Campbell Scientific datalogger to perform all of the standard datalogger support functions, including:

- check and set the datalogger clock
- send and receive datalogger programs
- view and edit input locations and labels
- set flags and ports
- collect data
- access the datalogger's remote keyboard mode through a terminal interface, and
- view collected data in a tabular display.

*PConnectCE* stores collected datalogger data in the handheld's internal memory. (Expansion memory cards are not supported in this version.) Using the data display feature, you can view this data while at the site. When the handheld is synchronized with the desktop computer, this data is moved to a specified data folder on the PC. New data from each station is appended to any existing data file on the PC.

The synchronization process also synchronizes datalogger program files between the PC and handheld device. Files copied to the handheld device's *PConnectCE* folder will automatically be transferred to the handheld during the next synchronization process. Using this process, you can store DLD files on the handheld device, and subsequently send them to the datalogger or use them for labels when viewing measurements (input locations). You can also retrieve programs from dataloggers to the handheld device, and use the synchronization process to copy them to the PC. If two different programs—one on the handheld device and another in *PConnectCE*'s programs folder on the PC—have the same name when you synchronize, the DLD on the PC will overwrite the DLD on the handheld device.

(Note: *PConnectCE* does not support data collection from Campbell Scientific's Storage Modules or Card Storage Modules.)

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<sup>1</sup> *PConnectCE* is a trademark of MeasureTek, Inc.

## 1.1 New Features in this Version

Several new features have been added to *PConnectCE* version 1.1. These are:

- Graphing of collected data on the Pocket PC device
- Compatibility with the newer XScale processors (Intel PXA250)
- Support for RF400 radio communication
- Support for COM2

## 2. Software Installation

### 2.1 Initial Installation

*PConnectCE* requires a handheld computer running Microsoft® Pocket PC, with a StrongARM, Hitachi SH3, MIPS, or Intel PXA250 processor. Computer requirements include a PC running a Windows-based, 32-bit operating system (Windows 95, 98, ME, NT, 2000, or XP) with a Pocket PC compatible version of Microsoft ActiveSync® installed.<sup>2</sup>

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#### NOTES

There is a difference in Pocket PC and Handheld PC. *PConnectCE* is not compatible with devices running the Handheld PC operating system.

At the time of publication, *PConnectCE* had been successfully tested with the following devices: Compaq iPAQ 3765 (Intel StrongARM), HP Jornada 540 (Hitachi SH3), Compaq Aero 1550 (MIPS), and Compaq iPAQ 3950 (Intel PXA250). Please contact CSI for a list of additional devices that have been tested.

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Make sure ActiveSync is installed on your PC and that a device partnership has been established with ActiveSync for the handheld device. A "New Partnership Wizard" that sets up this partnership is automatically launched in ActiveSync the first time you connect your handheld device to your computer. For additional information, refer to the ActiveSync on-line help.

Insert the *PConnectCE* compact disk into your CD-ROM drive and run the Setup.exe program from the disk. Follow the instructions on the screen to install the software. During the installation, you will be prompted for "Destination Location" for the software (the default is C:\Program Files\CampbellSci\PConnectCE). You will then be prompted to "Choose Working Folder" (default is C:\CampbellSci\PConnectCE). The first time you synchronize with the handheld device to download the *PConnectCE* software, a subdirectory for the device will be created in this Working Folder directory (e.g., C:\CampbellSci\PConnectCE\devicename). This subdirectory is where the data files retrieved using *PConnectCE* will be saved when you synchronize your handheld with the PC after data has been collected from a datalogger.

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<sup>2</sup> Microsoft and ActiveSync are registered trademarks of Microsoft Corporation in the United States and/or other countries.

This will also be the directory into which you will copy any files that should be transferred to the handheld for use with the datalogger, such as a new program file (\*.DLD).

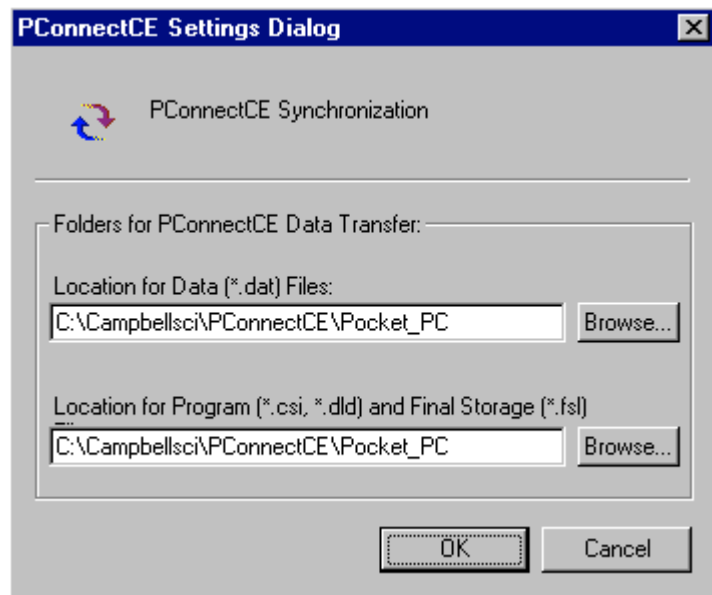
After you have installed the software on your PC, synchronize with your handheld device using ActiveSync. This will install *PConnectCE* on the handheld. After *PConnectCE* is installed, you will be asked to ensure that no further steps are required on the handheld to complete the installation. During the installation process an item will be placed on the handheld's Start | Programs | PConnectCE menu. Select this menu option to start the program.

**NOTE**

PConnectCE must be selected under ActiveSync's Tools | Options, Sync Options tab for data to be transferred to/from the handheld when it is synchronized with the computer. It is selected when a check mark appears beside the application name in the Sync Options list. In most instances, PConnectCE is selected automatically, but with some devices the user must do this manually.

If PConnectCE appears in the Sync Options list but its status is reflected as "Not Installed", close ActiveSync and disconnect the handheld. When you reopen ActiveSync's Sync Options list, PConnectCE should be available for selection.

After installation, you may change the folders for the data and DLD files by opening ActiveSync, Choosing Tools | Options from the menu, selecting PConnectCE from the list of programs on the Sync Options tab, and pressing the Settings button. A window will be displayed where you can specify a new directory to which the \*.DAT files will be saved and where the files to be sent to the handheld are placed.



You are now ready to use the *PConnectCE* software.

## 2.2 Installing the PConnectCE Upgrade

1. Disconnect the Pocket PC device from the computer.
2. From the ActiveSync menu, select **Tools | Options**.
3. On the **Sync Options** tab, clear the check box for the PConnectCE conduit. Press **OK** to close the Options dialog box.
4. Synchronize with the Pocket PC device. This will unload the ActiveSync provider for PConnectCE.

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**NOTE**

This step is crucial. If it is not followed, the software will not install properly on the Pocket PC device.

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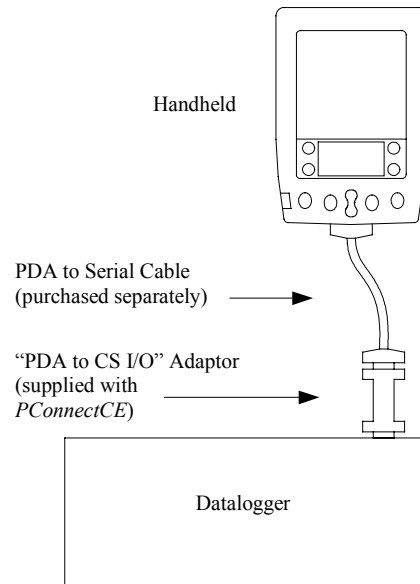
5. Install the PConnectCE 1.1 upgrade on your computer. The installation will ask if you want to upgrade the application; select **Yes**.
6. Open **Tools | Options** again from the ActiveSync menu. Re-enable the PConnectCE conduit by selecting the check box beside the text **PConnectCE** and close the dialog by selecting **OK**.
7. Synchronize again with the Pocket PC device; the software installation will be complete.

## 3. Connecting Your Pocket PC Handheld to the Datalogger

### 3.1 Direct Serial Connection

The most common method of connecting the PDA to the datalogger is using a direct serial connection. The handheld connects to the datalogger via its communications port. If you do not have one already, you will need to purchase a cable for your handheld that connects to the PDA's communication port and terminates in a 9-pin (female) serial port connector. Since this cable is specific to each handheld model, it is not included with the *PConnectCE* software. It can be purchased separately at office supply stores.

After connecting the PDA to serial cable to the handheld, use the supplied "PDA to CS I/O" adaptor to connect to the datalogger's CS I/O port:



Note that one side of the connector is labeled Datalogger, and the other side is labeled PDA. If the connections are reversed, communication with the datalogger will fail.

### 3.2 RF400 Radio Communication

Two RF400 radios can be used to communicate with the datalogger using the handheld. With this setup, the PDA to CS I/O connector is not used.

At the datalogger site, the CS I/O ports of the RF400 radio and the datalogger are connected using an SC12 or similar cable. Power for the RF400 is supplied by the datalogger's CS I/O port pin 8, which supplies 12 V.

The PDA device is connected to the base RF400 radio by using an RS-232 null modem cable between the PDA's serial connection and the RF400's RS-232 port. Typically, this is accomplished by using the PDA to serial cable, with a null modem connector at the end, connecting to the RF400's RS-232 port. Depending upon the type of null modem cable used, a gender changer may be necessary. An external power source will be needed for the RF400 base radio, since it cannot be powered by the handheld device.

Cables, gender changers, and power supplies can be purchased from local suppliers or from Campbell Scientific. Campbell Scientific offers a Null Modem Cable Kit (DB9 Male to DB9 Male, P/N 14392) for connecting the handheld device to the RF400 base. Two gender changers (P/N 14393) may be required for use with a customer-supplied null modem cable. The RF400 Base Station Kit (P/N 14220) provides an AC to 12V DC transformer for the RF400. The Field Power Cable (P/N 14291) provides a 12V DC barrel plug on one end for connection to the RF400 and two pigtails on the other end for use with other power supplies such as a vehicle's 12 V cigarette lighter accessory.

## 4. Using the *PConnectCE* Software

*PConnectCE* is started by selecting Start | Programs | *PConnectCE* on the handheld. The software has three main windows: the Station window, the Data window, and the Program window. You can navigate between these windows by pressing the lettered box for each window (S for Station, D for Data, and P for Program). The Station window is used to set up and communicate with the datalogger. The Data window is used to view a data file that has been collected from the datalogger. The Program window is used to view the DLD files that have been copied to the handheld.

When *PConnectCE* is first started, the Station window will appear. The first step is to configure the station for communication.

### 4.1 Configuring Stations



Your first datalogger will appear by default with the name, “Stn1”. You must provide a unique identity for each individual datalogger. To change the station setup, including the datalogger name, touch the station name and then select Edit | Properties to bring up the *Edit Station Parameters* screen:



On this screen you can change the station **Name**, select the **Datalogger** model, enter **Security Code**, associate a **Program File** to be used for the labels when viewing measurements, and select the mode of **Communication**.

The **Station** name can be any name up to 8 characters. It must contain alpha and/or numeric characters and cannot contain any spaces.

The datalogger model of the station is chosen by pressing the arrow to the right of the **Datalogger** field and selecting the desired datalogger type.

Dataloggers may have up to three levels of **Security**. Security is set when creating the datalogger program or in the datalogger's \*C mode. If security is enabled in the datalogger, you may need to enter the four-digit security code to collect data, set the datalogger's clock, and depending upon the level of security, even to connect to the datalogger. Refer to the datalogger's user manual for complete information on security codes.

A **Program File** can be associated with the datalogger to provide labels for the input locations when viewing them on the Measurements tab. (Note: only DLD files created with Edlog version 2.0 and greater will have these labels stored in the DLD.) If a program is already running in the datalogger and you have a copy of the DLD on the handheld, you can associate the program with the station. When you download a new program to the datalogger using *PConnectCE*, you will be asked if you want the label descriptions to be changed to reflect the new program.

The communication mode can be specified by selecting it from the **Communication** field. *PConnectCE* supports direct serial communication and point-to-multipoint RF400 radio communication (see Section 3).

When the RF400 is selected, an RF Net Address and an RF Radio Address must be entered. These two settings must reflect the settings in the remote RF400 radio. *PConnectCE* will temporarily set the RF base modem's addresses to the addresses specified, and then return them to the previous values after you disconnect.



When you are finished editing the station parameters, touch **OK**. You will be returned to the *Stations* window.

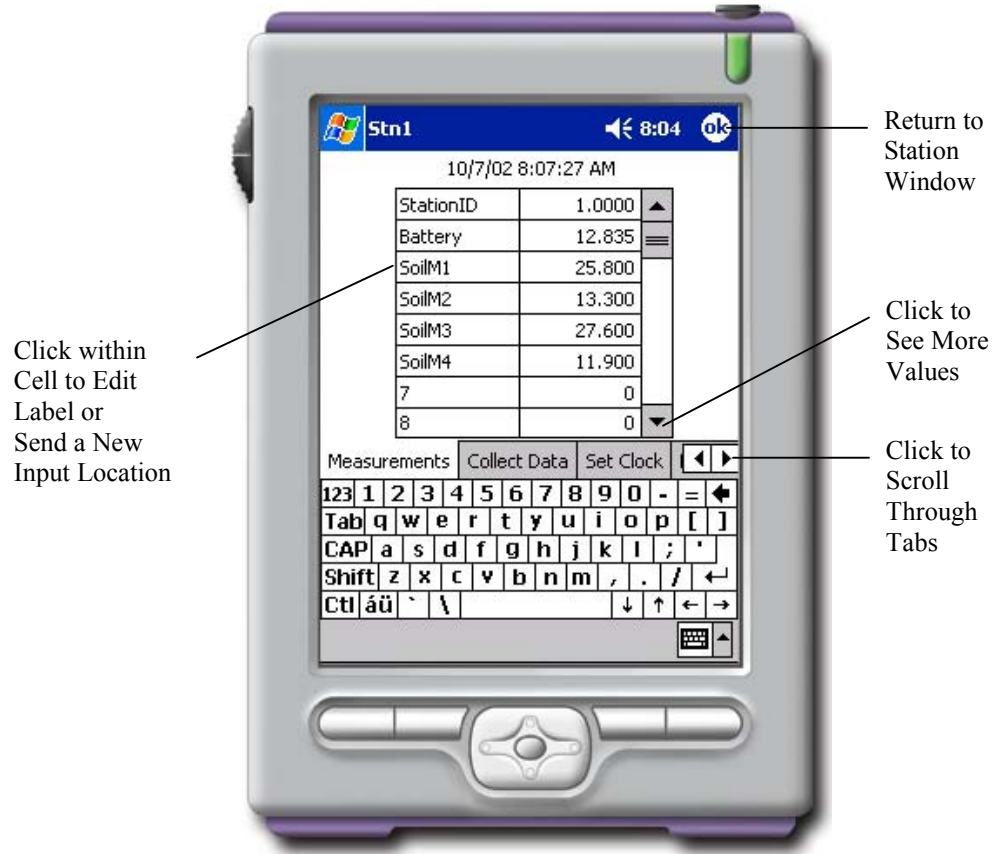
If you will be using the handheld to collect data from more than one datalogger, you will need to create additional stations. To do this, select **New** from the menu. The *New Stations* window will be displayed. The fields on this window are identical to the fields for the *Edit Station Parameters* window. Once the fields are completed, touch **OK** to save the new station. You will be returned to the *Station* window.

A station can be deleted by highlighting it and pressing the **Delete** button. You will be prompted to confirm the deletion.



## 4.2 Connecting to the Station

From the Station window, choose a station to connect to and touch **Connect**. The *Measurements* tab will appear, displaying the current input locations in the datalogger.



Because of the small screen size, you may see only a portion of the input locations in the datalogger. Touch the up or down arrows to the right of the measurement cells to scroll through the values.

The value of an input location can be changed from the Measurements tab. Highlight the cell, enter a new value, and press Enter. You can change the descriptive labels for the measurements similarly.

There are five other tabs you can switch to, to accomplish other tasks with the datalogger. They are the Collect Data tab, the Set Clock tab, the Ports/Flags tab, the Terminal tab, and the Transfer Program tab.

### Collect Data

The Collect Data tab is used to collect data from the datalogger and store it to a file on the handheld. The name of the file is the *station\_name.bdf*. Note that the data is stored in binary format on the handheld and then converted to a comma-separated ASCII format when the file is transferred to the PC during the synchronization process.



There are three data collection options:

- **Collect Since Last Time** - This will collect only the new data that has been stored since the last time data was collected using this handheld. If this is a first data collection attempt, all data will be collected.
- **Collect All** - This will collect all data currently in datalogger memory, regardless of whether the data has been collected previously.
- **Collect Last # of Records** - This will collect only the number of records entered into the adjacent field.

When the handheld is synchronized with the PC and the data file is transferred, the data will be appended to any data file that exists with the same name. During the transfer, the data is converted to comma-separated ASCII format. After the file is transferred, the binary file is deleted from the handheld.

### **Set Clock**

The datalogger's clock can be set to that of the handheld's by switching to the Set Clock tab and touching the Set Clock button. Note that the two clocks may not match exactly, since there will always be some time lag between when the command is sent and when it is received by the datalogger.



Campbell Scientific typically advises against frequent routine setting of the datalogger's clock. In most instances, the datalogger's clock will be much more accurate than the handheld's. Setting the clock could result in data with duplicate or missing timestamps, especially if data is being saved in final storage fairly quickly. For instance, assume you are storing 1-minute data. If the datalogger's clock reaches 11:45 and it stores data for that period, and then you set the clock using a handheld whose internal clock reads 11:44, you will end up with two different arrays of data with a timestamp of 11:45.

### Flags/Ports

The datalogger's ports and flags can be viewed and toggled from the Flags/Ports tab. All of the flags and ports in the datalogger are displayed on the screen. If a flag or port is High, a check mark will appear in the box beside the port or flag. If a flag or port is low, the box will be empty.



To change the state of a port or flag, touch the box for that port or flag. There may be a small time lag between when the box is touched and when the state of the port or flag appears to change.

### **Terminal**

When the Terminal tab is selected, the remote communications command is sent to the datalogger and it is put into a remote communications state. This state allows the user to send telecommunications command directly to the datalogger and is typically used for trouble-shooting.



To return the datalogger to its program execution state, enter \*0. LOG1, LOG2, or LOG12 should be displayed indicating that the code in program table 1, and/or program table 2, is being run.

This option should be used with caution since it is possible to delete instructions in the datalogger's program or delete data from the datalogger while in this mode. Refer to the datalogger's user manual for complete information on the remote communications mode.

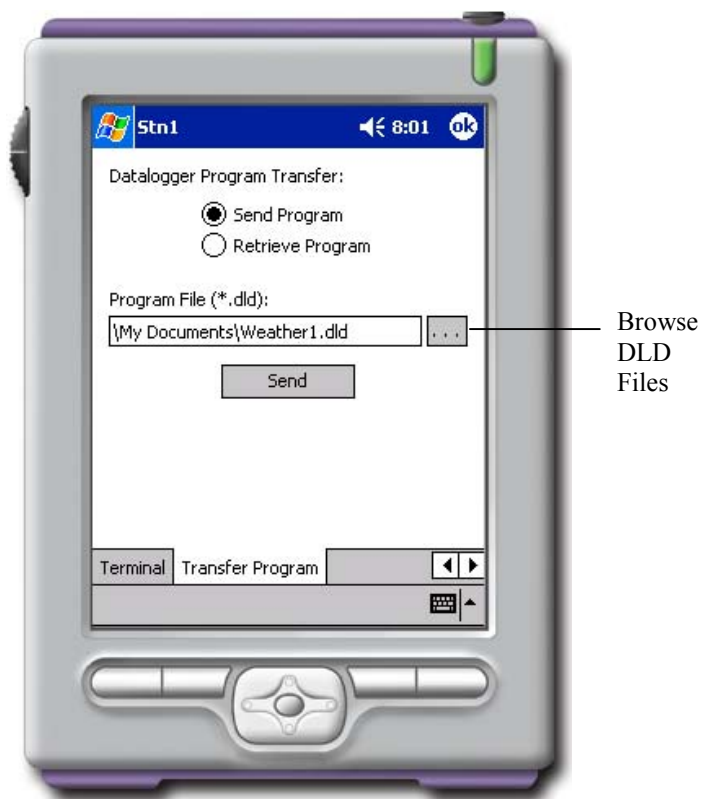
### Transfer Program

Switch to the Transfer Program tab to send a new program file (DLD) to the datalogger, or to retrieve the program file that is currently running in the datalogger.

First, select the desired option, and then touch the Browse button to the right of the File field to choose the file to be sent or to enter a name for the retrieved file. After the File field is completed, press the Send (or Retrieve) button.

If you want to copy a DLD file to the handheld so it can be transferred to the datalogger, make sure the DLD is stored in the handheld device's Working Directory folder on the PC. The next time you synchronize with the handheld, the file will be copied.

If you retrieve a DLD file from the datalogger, the next time you synchronize with the handheld, the file will be uploaded to the Working Directory for the device.



### 4.3 Viewing Data on the Handheld

Once data is collected onto your handheld, you can view the file in a comma-separated or tabular format. You can also graph the values for one data point at a time.

From the Station window, press the letter D to open a window that displays all of the data files on the handheld. To view a data file, simply click the filename. The data files are given a BDF extension on the handheld, since they are stored in binary format to conserve memory. They will be converted to comma-separated ASCII format during the synchronization process.

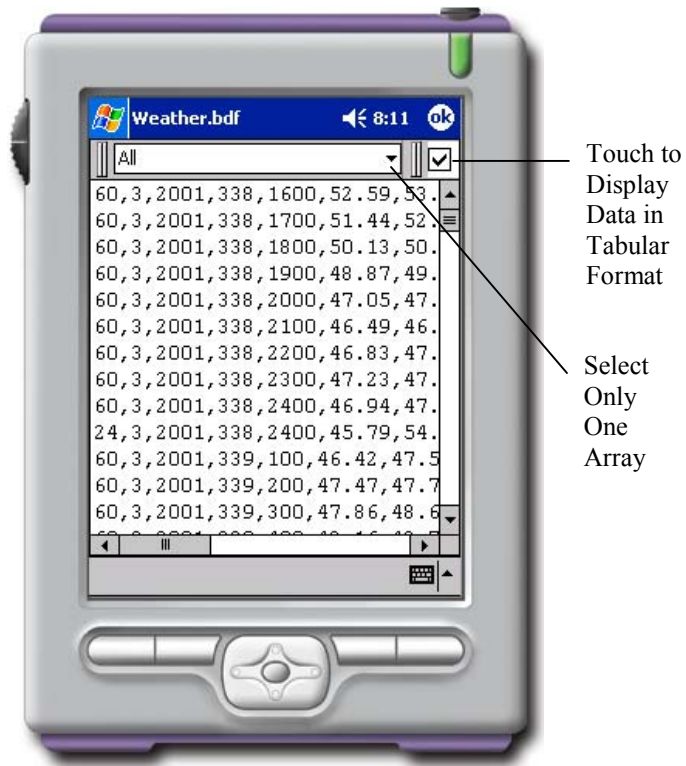


When the data file is opened, it will be displayed in a tabular format. To view the data in a comma-separated format, select the checkbox in the upper right corner of the display.

As you scroll through the data, note that all of the collected arrays are displayed intermixed as they were retrieved from the datalogger. To graph a column of data, you must limit the display to only one array type. Tap the Array ID drop-down arrow and select the ID of the array from which you want to graph data. Double tap the column of interest to graph it. You can scroll back and forth within the data. To see the value and the time stamp of a particular point, just tap that point.

If an FSL file with the same name as the DLD file name exists on the handheld, *PConnectCE* will use the FSL to derive column labels, graph labels, and time stamps when viewing the data. If an FSL with the same program name does not exist, *PConnectCE* will prompt you to select a file. To transfer an FSL file to the handheld, place the file in the *PConnectCE/devicename* directory and the file will be copied during the next synchronization operation.

A data file can be deleted from the handheld device by pressing the **Delete** button. You will be asked to confirm the deletion. A data file that has been deleted will not be transferred when the handheld device is synchronized with the computer, and it cannot be restored once deleted.

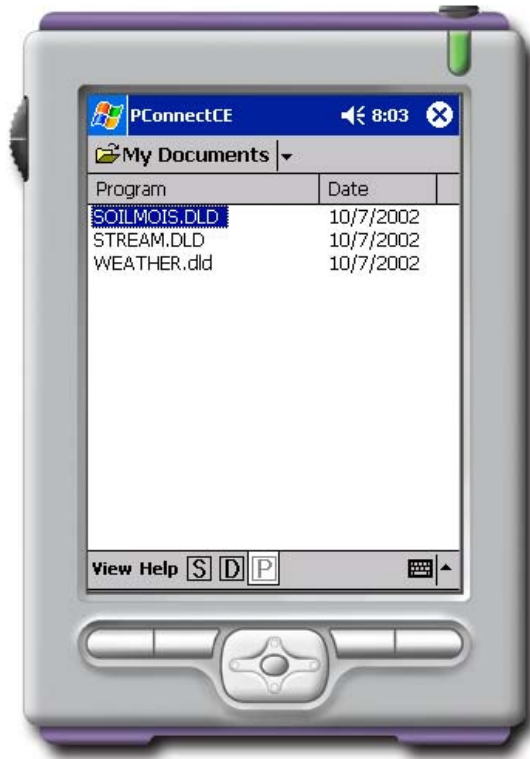


## 4.4 Viewing Datalogger Programs

If there were any program (CSI, DLD, or FSL) files in the handheld device's working directory when you synchronized it with the computer, they will be transferred to the handheld. To see a list of the datalogger program files that are stored on the handheld, touch the letter P to display the Program window.

A list of available programs will be displayed on the left side of the window. On the right side of the window, the date of the last time the program was downloaded to the handheld will be displayed. To view a program, simply highlight the program name. The DLD code will be displayed; however, it cannot be edited. To close the program, touch the OK.





## 4.5 Transferring Data to Your Desktop Computer

Once data is collected onto your handheld, you can synchronize with your desktop computer and the data will automatically transfer to the folder you specified during the initial setup. Data is stored on the handheld device in the same binary format as in the datalogger to conserve memory. It is converted to comma-separated ASCII during the synchronization process and appended to the data file on the PC **named after the station** from which it was retrieved.

