



E.H. Wachs  
600 Knightsbridge Parkway  
Lincolnshire, IL 60069  
[www.ehwachs.com](http://www.ehwachs.com)

## Vitals Help File



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## ABOUT THIS MANUAL

This manual is provided as an electronic help file (PDF format) on the Vitals software disk. You can open the file from the Help menu in the Vitals Desktop program, or double-click on it in the disk window.

The manual is designed to display on a standard computer screen. Use the PDF Bookmark panel to find topics in the manual. Click on a bookmark to go directly to that topic.

You can print the manual if you want a hard copy. It is designed to print on standard letter-sized paper. Set the page orientation to Landscape (wide) before printing.

## ABOUT VITALS

Vitals (Valve Information Tracking and Logging System) is an integrated hardware/software system to support water system valve maintenance programs. It includes the following components:

- the Vitals Recon controller, a hand-held computer running Vitals Mobile software, which operates the Wachs valve exercising equipment and stores valve data
- the Vitals Desktop software, a Windows-based program for creating valve records, and storing and analyzing valve exercising data.

The Vitals Recon controller and Vitals software are provided with compatible Wachs valve operators. Currently, these are the TM-7 truck mounted valve operator and the ERV-750 extended reach valve operator.

## THE VITALS RECON CONTROLLER

The Vitals controller is used to operate Wachs valve exercising equipment and to log and transfer valve exercising data. The controller hardware is a ruggedized handheld computer running the Windows Mobile operating system. The following sections describe the operation of the controller. For detailed technical information on the controller, see the “TDS Recon Getting Started Guide” included with it.

The controller has a touch screen for user interaction, with a stylus provided for easy use of the interface. Figure 1 illustrates the controller.



*Figure 1. The Vitals controller with its pen stylus. The optional GPS receiver is located under the top “cap”.*

## Control Pad

A control pad below the screen has buttons for basic functions of the controller. Refer to the “TDS Recon Getting Started Guide” for detailed instructions on using the buttons. (All features of the Vitals Mobile software use touch screen controls and do not require using the control pad.) Figure 2 shows the control pad.

Press the Power button to turn the controller on and off. There is no “Shut Down” function on the controller.

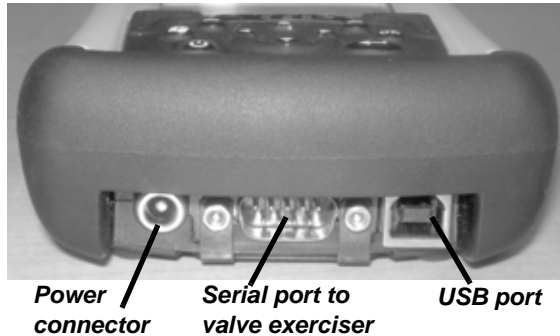


**Power button**

*Figure 2. The Vitals controller control pad. Use the Power button to turn the controller on and off. Refer to the “TDS Recon Getting Started Guide” for instructions on using the control pad.*

## Controller Ports

A serial port is used for connection to the valve exerciser, and a USB port connects to a PC for data transfer or software installation. There is also a power connector.



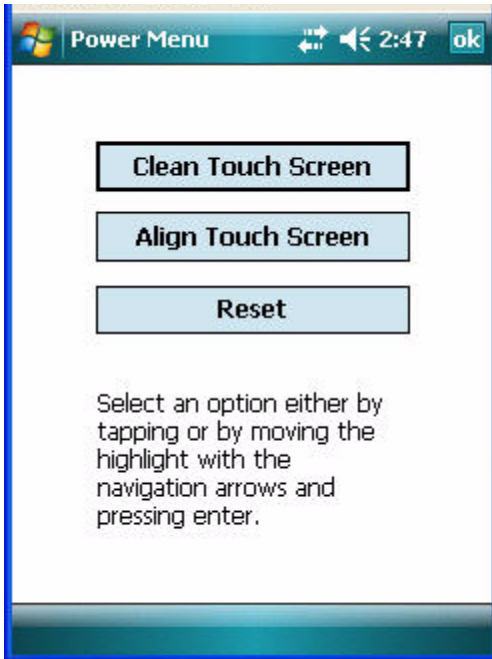
*Figure 3. The photo shows the ports on the Vitals Recon controller.*

## Resetting the Controller

Display the Power Menu by pressing and holding the power button. The reset warning screen appears, with a five-second countdown. Release the power button. The Power Menu will appear, as shown on the next page.



The Power Menu has commands for the following functions:



- cleaning the touch screen (the touch interface is disabled while you clean the screen)
- aligning the touch screen
- resetting the controller. Tap the **Reset** button to restart it.

## Battery Charging and Care

Before using the Vitals Recon controller for the first time, charge it for at least 12 hours using the charging cable provided with it. This will ensure it is fully charged. The controller is estimated to operate from 10 to 33 hours on a full charge.



*Power connector*

The TM-7 and ERV-750 valve operators include charging cables that plug into the con-

troller's power port. When the controller is attached to the valve operator, keep it charged by connecting the power cable to it. This will provide a much longer operating time.

Using the GPS receiver greatly increases the power requirements of the controller. Do not activate the GPS receiver if you are not using it. When you are using GPS, keep the power cable plugged into the controller if possible.

See the E.H. Wachs battery life document provided with the controller for detailed battery care guidelines.

## VITALS MOBILE SOFTWARE

Vitals Mobile runs on the Windows Mobile operating system, and is pre-installed on the Vitals controller. Vitals Mobile provides controls for Wachs valve operators, and can store and transfer valve exercising data. You can transfer valve records from a PC to the controller, or enter valve records using Vitals Mobile while in the field.

To start Vitals Mobile, tap the Start menu on the controller touchscreen and then tap the “Vitals Mobile” command. The Vitals Mobile main screen appears.



### NOTE

If Vitals Mobile does not appear in the Start menu, select the Programs command to open the Programs window, then open Vitals Mobile from there.

## GPS OPTION

An optional GPS receiver card is available to help find and log valve locations. The GPS receiver is a standard Compact Flash (CF) card that fits in the slot on the top of the Vitals Recon controller. The antenna section of the card extends above the controller, and is covered by an extended CF cap that keeps the controller sealed. The card and extended cap are shown in Figure 4.



*Figure 4. The photo shows the GPS receiver card and the extended cap that is provided with it.*



### NOTE

Use only the GPS card supplied by E.H. Wachs for the Vitals Recon controller. Other GPS cards have not been tested with the controller and are not verified to work with it.

When you enable GPS positioning during valve exercising, the location of the valve is automatically detected and logged in the valve activity dataset.

## Installing the GPS Card

Use the following procedure to install a GPS card in the Vitals Recon controller.



1. Using a Philips screwdriver, remove the two screws holding the cap on the

controller.



3. Using a flat screwdriver or the flat end of the stylus, turn the locking screws on the extended controller cap so that the arrows point up.



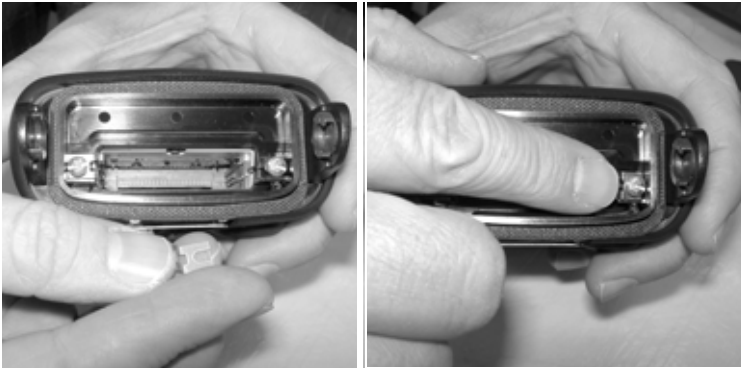
4. Pull the cover from the base of the extended cap.



2. Pull the cap off the top of the controller.



5. Put the base of the extended cap onto the controller. Insert the screws a few turns, leaving them loose.



6. Put the clips onto the screws as shown. Hold the controller upright so that the clips do not fall out.



7. Carefully insert the GPS card into the CF slot as shown, sliding it between the clips.



**NOTE**

When the card is inserted, the controller will power itself on and detect the card. Continue the installation steps in this section, then go to “Configuring the GPS Card” in the next section.



8. Tighten the screws to secure the clips and the GPS card.



pointing up.

9. Make sure the locking screws on the large cap base are aligned with the arrows



10. Install the cover onto the base of the extended cap.



that the arrows point down.

11. Using a flat screwdriver or the flat end of the stylus, turn the locking screws so

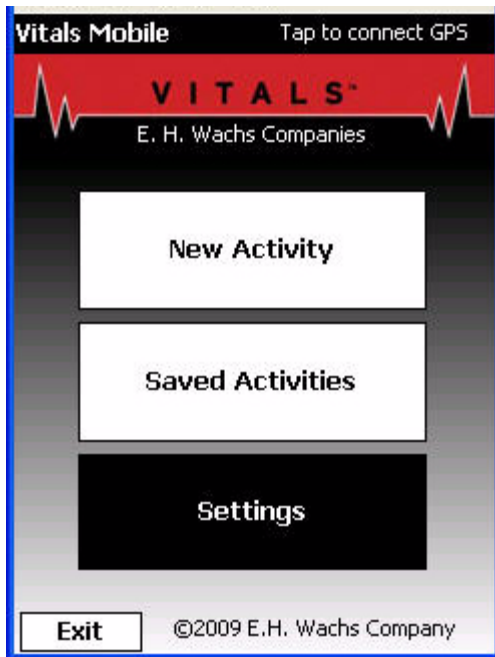


**NOTE**

Make sure the locking screws are tightened, with the arrows pointing down. Failure to tighten the locking screws will allow water

to get into the controller and damage it.

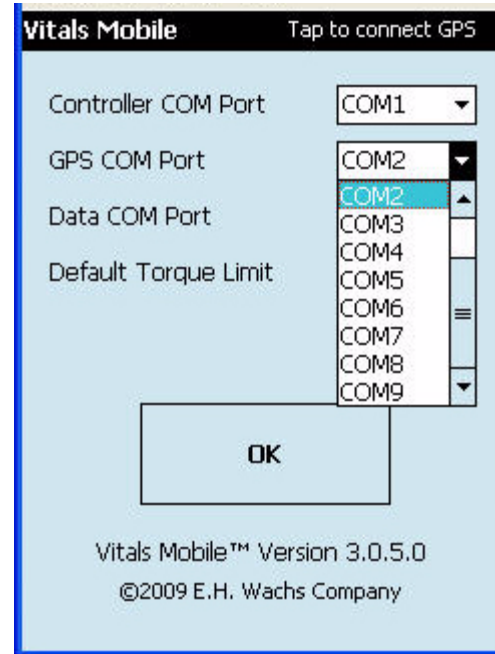
### Configuring the GPS Card



Once you have configured the GPS card the first time you use it, you should not have to configure it again.

1. When the GPS card is installed, start the Vitals Mobile software.

2. On the Vitals Mobile main screen, tap the Settings button.



3. On the Settings screen, tap the drop-down menu for the GPS COM Port.

4. Scroll the menu to select a port number that is not being used by one of the other ports.

5. Click the OK button to close the Settings screen.

## CONTROLLING THE VALVE OPERATOR

To use the Vitals Recon controller with the valve operator (TM-7 or ERV-750), connect it to the control and power cables supplied with the valve operator. See the following sections on connecting the controller.

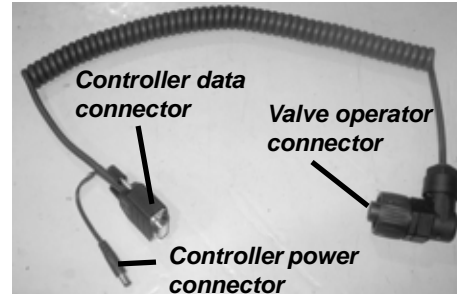
When the controller is connected to the valve operator, you can set it in the storage cradle on the machine. Remove the controller from the cradle to operate the machine.

Disconnect the controller and store it in its case before moving the valve operator vehicle or trailer.

### Connecting the Controller

The valve operators have a combined data/power cable to connect the Vitals Recon controller. When using the controller with the valve operator, plug in the power connector to keep the controller battery charged.

The following photos illustrate how to connect the controller.



The control cable connects the valve operator to the Vitals Recon controller.



Connect the data connector to the 9-pin serial port on the controller.



Connect the power connector to the power port on the controller.

## Starting a New Activity

Make sure that the controller is connected to the valve operator, and that the valve operator is powered on. Set up the valve operator on the valve before starting the controller.

This procedure will create a valve activity record for a new or existing valve in the database. If you simply want to operate a valve without logging data, go to the section “Valve Operation Without Data Logging” below.



### NOTE

You may need to use the controller to “jog” the valve operator to align the valve socket on the valve’s drive nut. See the instructions in

the section “The Wachs Controller Program” that follows.

1. Remove the Vitals Recon controller from its storage cradle on the valve operator.
2. Press the Power button on the control pad to turn on the controller.

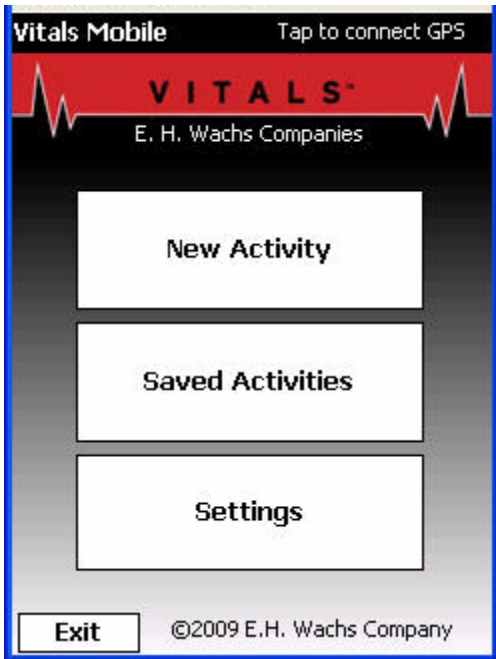


3. Tap the **Start** menu and select **Vitals Mobile** from the menu. The Vitals Mobile program will take a few seconds to start up, and the main screen will appear.

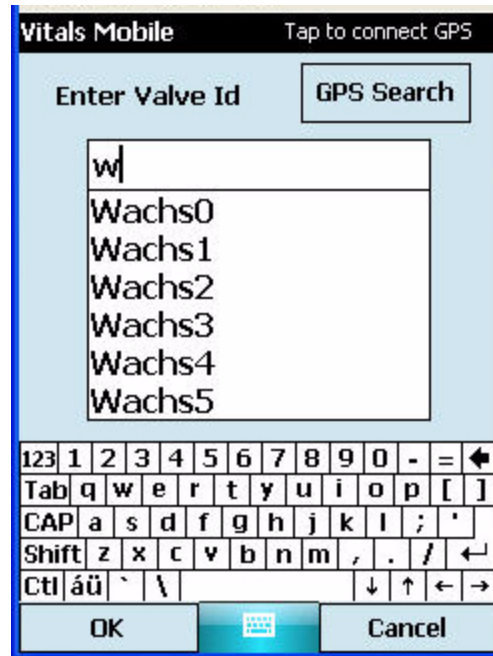


### NOTE

If Vitals Mobile does not appear in the Start menu, select the Programs command to open the Programs window, then open Vitals Mobile from there.

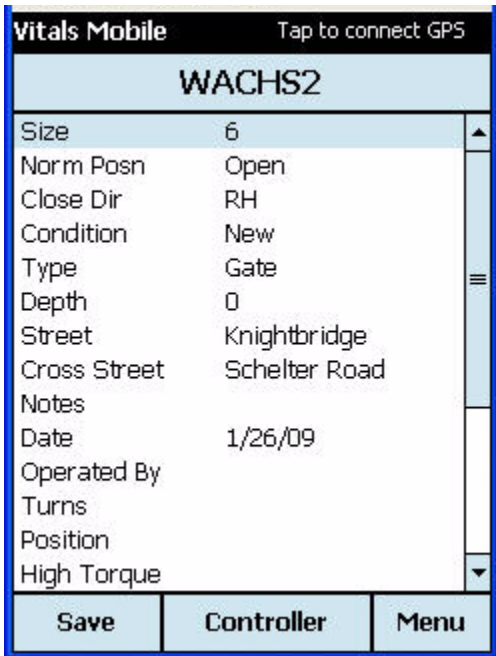


4. Tap the **New Activity** button on the main screen. The Enter Valve ID screen appears, with a list of all valve records stored in the controller.



5. Use the on-screen keyboard to type in a valve ID. As you type, the names of valves that match will appear in the list. For instance, if you type **A**, all valve IDs that start with **A** will appear. Tap on an ID in the list to select it.

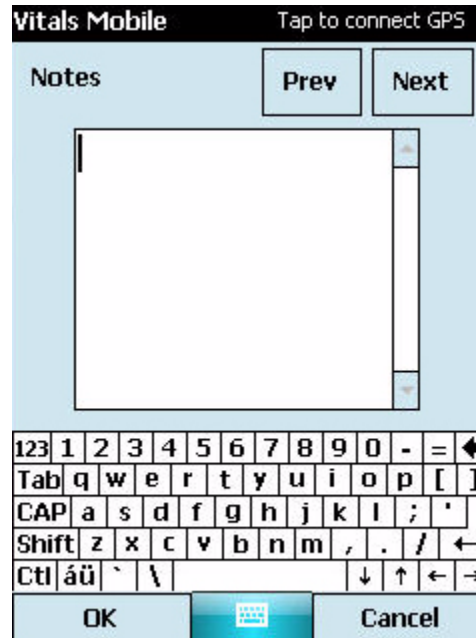
6. If the valve ID is not stored on the controller, you can type in a new ID to create a new valve record.
7. Click the **OK** button. The valve record screen will appear.



8. The valve record screen displays any information stored in the record for the valve. Scroll down using the scroll bar to display all the data fields.

9. You can add or edit information for any data field on the screen by tapping on it to

open an editing screen. The figure on the next page shows the editing screen for the **Notes** field.



10. Type or select data on the screen. You can go through the data fields for the valve using the **Prev** and **Next** buttons, or tap **OK** to go back to the valve record screen.

11. When you are finished adding data to the valve record fields, tap **OK** to return to the

valve record screen. The screen will be updated with the new information.

12. Tap the **Controller** button on the valve record screen to start the Wachs Controller program. Use the Controller as described in the next section to perform the valve operation.

## The Wachs Controller Program

Vitals Mobile		
Tap to connect GPS		
Torque <b>0</b>	Highest <b>0</b>	Limit <b>200</b>
Count <b>0.0</b>	Direction <b>?</b>	Mode <b>EXER</b>
<b>START</b>		Jog LH
		Jog RH
Back	Reset	Settings
Waiting to connect		

The Controller program is used to control the valve operator. It provides machine control functions and displays information about the valve activity as the machine runs.

To exercise the valve using Wachs' patented Intelligent "Reverse and

Turn" exercising procedure, make sure the **Mode** is set to **EXER**, then simply tap the **START** button. The valve operator will perform an automated valve exercising routine. See the "Intelligent Automation" section below for a detailed description.

The following figures describe the functions of the Wachs Controller.

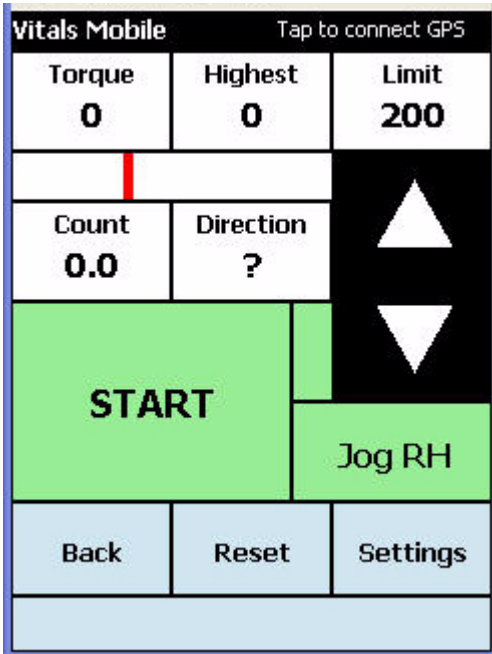
Vitals Mobile		
Tap to connect GPS		
Torque <b>0</b>	Highest <b>0</b>	Limit <b>200</b>
Count <b>0.0</b>	Direction <b>?</b>	Mode <b>EXER</b>
<b>START</b>		Jog LH
		Jog RH
Back	Reset	Settings
Waiting to connect		

- **Torque** displays the current operating torque.
- **Highest** displays the highest torque level during the current operation.
- **Limit** displays the current torque limit.
- **Count** displays the number of revolutions during the current operation.
- **Direction** displays the current turning direction.

- **Mode** displays the valve operation mode: **EXER** (exercising) or **MAN** (manual operation).
- **START** begins the valve operating procedure. When the machine is running, the button reads **STOP**.
- **Jog LH** and **Jog RH** turn the valve operator only when you are pressing them. Use them to turn the operator to align the key.
- **Back** exits the Wachs Controller program.
- **Reset** will restore the valve activity readings to their starting state.

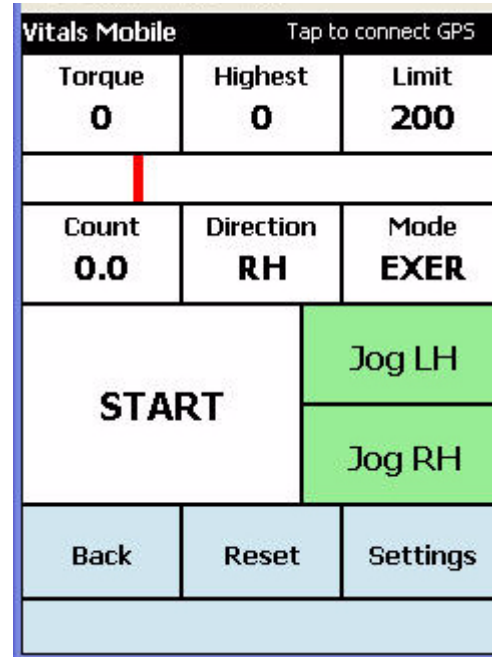
- **Settings** opens the Settings screen.

### Changing the Torque Limit



Tap the **Limit** field to change the torque limit. Up and down arrows will appear. Tap the arrows to raise or lower the torque limit in increments of 50 lb-ft. Tap **Limit** again to hide the arrows.

### Changing the Valve Turning Direction



Tap the **Direction** field to set the direction of the valve operator. The setting will cycle from ? to RH to LH.

## Changing the Valve Operating Mode

Vitals Mobile <span style="float: right;">Tap to connect GPS</span>		
Torque <b>0</b>	Highest <b>0</b>	Limit <b>200</b>
Count <b>0.0</b>		
Count <b>0.0</b>	Direction <b>?</b>	Mode <b>MAN</b>
<b>START</b>		Jog LH
		Jog RH
Back	Reset	Settings

Tap the **Mode** field to change the operating mode. **EXER** (exercising) uses the automated valve exercising procedure (see “Intelligent ‘Reverse and Turn’ Valve Exercising” below). **MAN** lets you manually control the direction and stop/start of the valve operator.

## Intelligent “Reverse and Turn” Valve Exercising

When you run the valve operator in **EXER** mode, it uses the Intelligent “Reverse and Turn” exercising protocol to determine direction of valve rotation.

The valve operator starts with a “break-loose” procedure. It turns in one direction, stopping if it meets resistance of 50 lb-ft of torque. It reverses direction, again trying to turn the valve with 50 lb-ft. If unsuccessful, it will reverse again and increase torque to 100 lb-ft.

The operator will continue this back-and-forth procedure (increasing torque in 50 lb-ft increments up to the torque limit) until it finds the valve’s free-turning direction. At this point, the **Direction** button will change to **RH** or **LH**. The controller will lower the torque limit to the minimum required to keep the valve turning.

When the valve operator meets resistance and reaches the torque limit, it stops and reverses a few rotations, then tries to rotate forward again. If it can’t turn, the controller displays **Insufficient Torque**. Check the **Count** button to see if you have reached the valve’s expected end of travel. If you think the valve should turn further, increase the torque limit and tap the **START** button again. See if the valve turns any further. You may have to increase the torque limit additional steps.

## Using GPS

To include GPS data in your valve activity record, you need to have the GPS receiver installed and configured as described above in the “GPS Option” section. When you enable GPS positioning during valve exercising, the location of the valve is automatically detected and logged in the valve activity data set.

### Enabling GPS

To automatically detect and log valve positions, enable GPS using the following procedure.

1. Tap the **Tap to connect GPS** command at the top of the screen. The command will change to say **Waiting for fix**.
2. It may take up to several minutes to detect satellite signals and fix location. When a fix is established, the command will display signal information, in the format **HDOP 2.3 Sats 9W** (the numbers will differ depending on signal strength and number of satellites detected).

### GPS Status Bar

The following status messages will appear on the GPS status bar at the top right of the Vitals Mobile screen.

- **Tap to connect GPS**—Indicates the GPS port is disconnected. Tap to enable GPS. NOTE: This message is displayed if there is no GPS card installed in the controller.
- **Connecting GPS**—Indicates the GPS port is being configured to receive data.
- **Waiting for data**—The GPS port has been opened and is waiting for GPS data.
- **Waiting for fix**—The GPS card is identifying GPS satellites for determining position. This may take several minutes.
- **HDOP 2.3 Sats 9W**—This is an example of the “connected” GPS status message. The numbers may differ depending on signal strength and number of satellites detected.

## **GPS Logging Mode**

You can increase GPS accuracy by logging positions over a period of time. To do this, tap the button in the right corner of the status bar to turn on GPS Logging Mode while performing a valve operation.

- **GPS Logging On**—The button in the corner turns green and the number increments with each GPS reading taken. The position is logged every 1.5 seconds.
- **GPS Logging Off**—Tap the green button to turn off GPS logging.

## **GPS Technical Information**

HDOP (Horizontal Dilution of Precision) is an indication of satellite geometry, or coverage, over a certain location. GPS accuracy is best when satellites are visible in all directions of the sky.

An HDOP value of 4.0 or less indicates good satellite coverage. A higher HDOP results when satellites are too close together, or are visible in only a portion of the sky.

In addition to HDOP, the controller's GPS status bar displays the number of satellites being tracked—as in **Sats 7**. If there is a W after the number, the GPS receiver is tracking WAAS (Wide Area Augmentation System) satellites, which increase position accuracy up to 500% by correcting for GPS signal errors.

## Valve Operation Without Data Logging

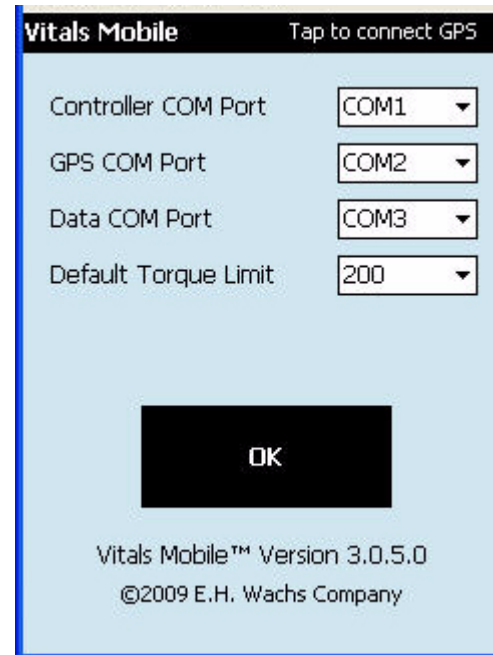
Use this procedure to run the valve operator without creating an activity record and logging data.

1. On the Vitals Mobile main screen, tap the **New Activity** button.
2. On the **Enter Valve ID** screen, tap the **OK** button without selecting a valve ID.
3. On the valve activity screen, tap the **Controller** button. The Wachs Controller program will start. Use the controller as described in the next section to perform the valve operation.
4. When you are finished operating the valve, click the **Back** button on the Wachs Controller screen. The valve activity screen appears.
5. Tap **Menu** at the bottom right, then tap **Cancel Activity**. Confirm by tapping **Yes** in the **Cancel Activity?** dialog.

## CHANGING CONTROLLER SETTINGS

You can access the Setting screen by tapping the **Settings** button on the main screen, or by selecting **Settings** from the **Menu** button on the valve activity screens.

The illustration on the next page shows the Settings screen.



1. You can change the COM port for the controller connection (the serial port on the controller), for the GPS receiver (the CF card slot), and the data COM port (the USB port on the controller). Once these ports are set up, you should not have to change them.

2. You can change the Default Torque Limit for the Wachs Controller program. The installed default is 200 lb-ft. You can change it to 100 or 150 lb-ft.

- When you have finished changing settings, tap the **OK** button on the Settings screen. You will return to the screen you came from.



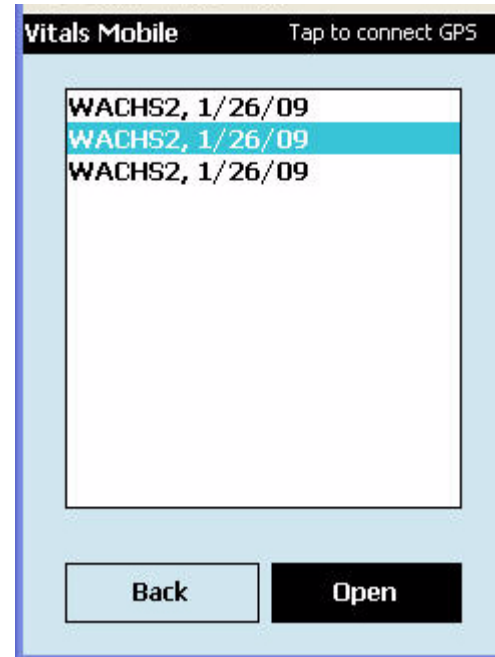
**NOTE**

To avoid damaging a valve, you cannot set the default torque limit above 200 lb-ft. You can increase

the torque limit as necessary while performing a valve operation.

## REVIEWING SAVED ACTIVITIES

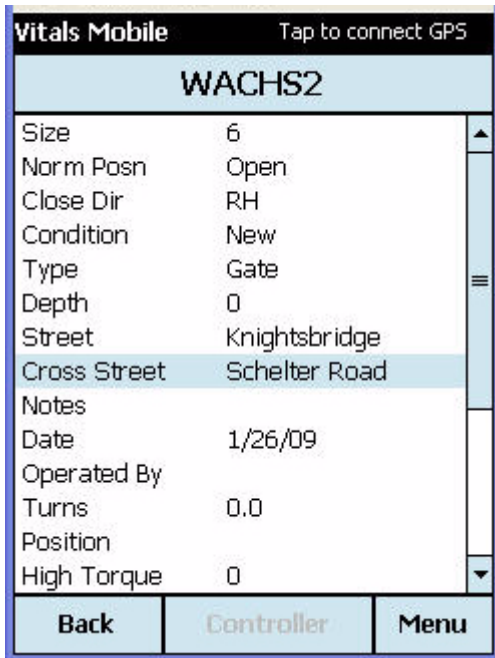
You can review and edit valve activities saved on the controller.



- Tap the **Saved Activities** button on the main screen. The saved activities screen appears. Each record includes the ID of the valve and the date of the activity.

- Tap on the activity you want to select it, then click the **Open** button. The valve record screen

appears.



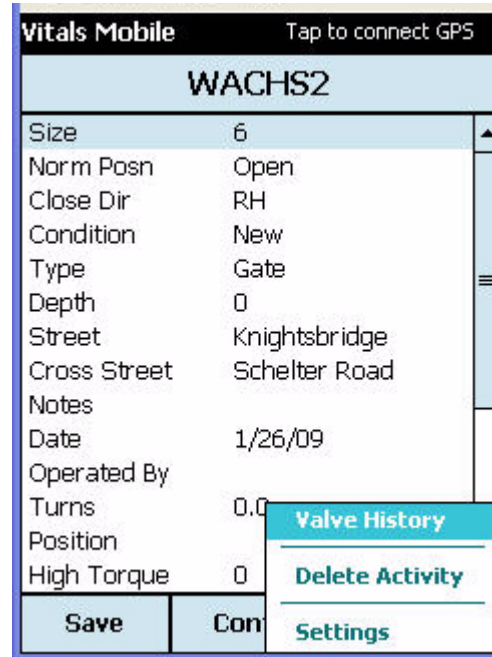
3. You can tap on any field to open the editing screen for that field.

4. To change the data in the field, type or select a new value on the editing screen.

**NOTE:** The valve activity data is generated by the valve operator during exercising. You should not change the values for these fields:

- Date
- Turns
- High Torque
- Begin Time
- End Time
- Latitude
- Longitude
- GPS Positions

- GPSMAPS
- TrqChart



5. If you want to delete the activity, tap **Menu** at the bottom of the screen and tap the **Delete Activity** command. At the **Delete Activity?** prompt, tap **Yes** to delete, or **No** to cancel.



**NOTE**

You can delete an activity record, but you cannot delete a valve ID from the controller.

## INSTALLING VITALS DESKTOP ON YOUR PC

Vitals Desktop is an application that allows you to create and manage a database for valve maintenance. You can transfer valve records, including GPS data, to the Vitals Recon controller. After exercising valves in the field, you can transfer the activity records back from the controller to the Vitals Desktop database for storage and analysis.

Before transferring data between your PC and the Vitals Recon controller, you will need to install Microsoft ActiveSync (included on the TDS Recon disk) and the Vitals Desktop application. Follow the instructions in this section to complete the software installation.

1. Insert the Vitals Installer CD into your optical disk drive.
2. Open the CD disk window. If the Vitals Desktop Setup window does not appear, double-click the Vitals Desktop Setup icon.
3. The Welcome screen appears, as shown on the next page. Click the **Next** button.





**NOTE:** if you have a previous version of Vitals already installed, you will get a message that the folder already exists. Click **Yes** to install Vitals Desktop into the same folder, or **No** to rename the folder.

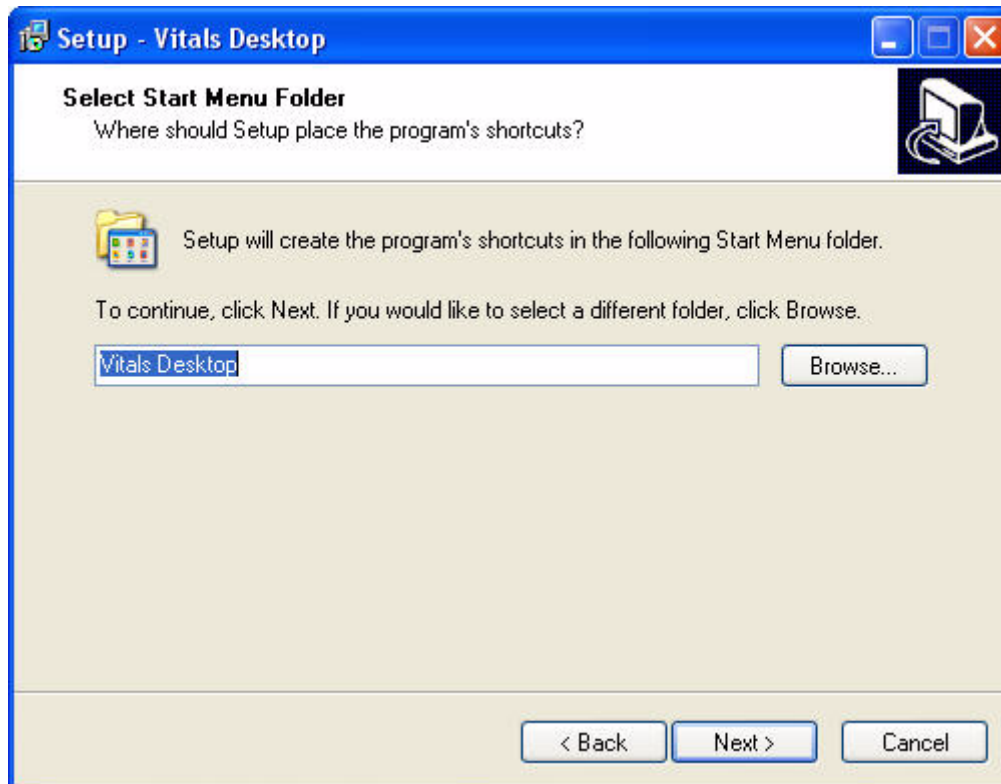
4. The “Select Destination Location” screen appears (page 25). If you want to change the default location

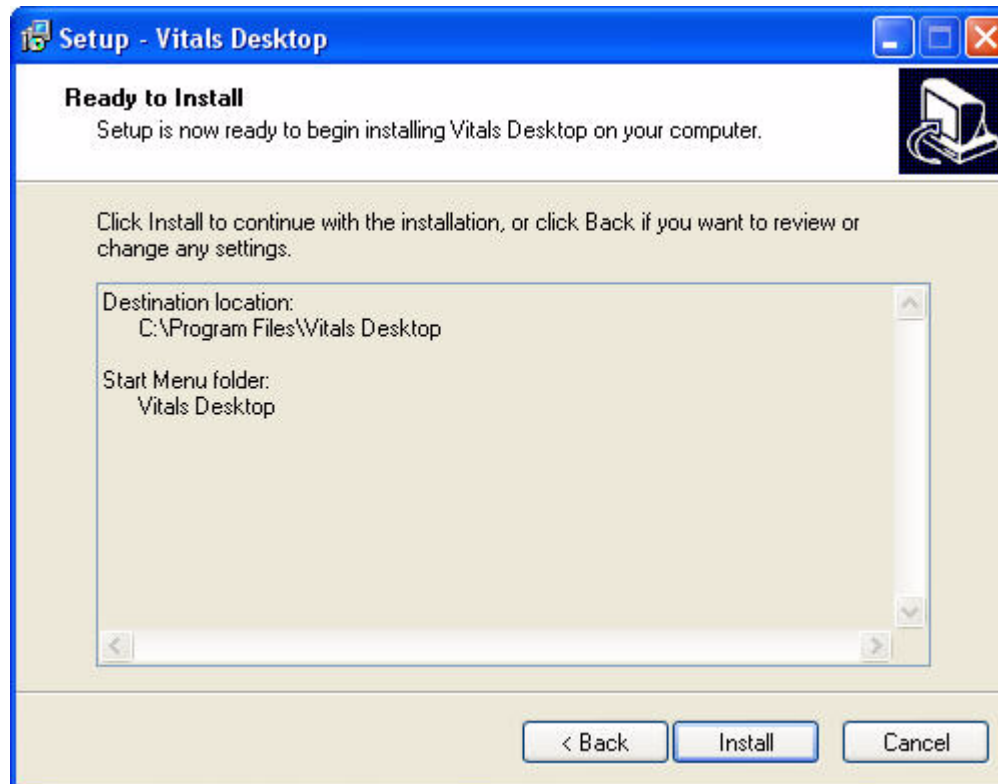
for installing the program, click the **Browse...** button and navigate to the folder you want. Click **Next**.

5. The “Select Start Menu Folder” screen appears (page 26). If you want to change the default location for the Start menu command, click the **Browse...** button and navigate to the folder you want. Click **Next**.

6. The “Ready to Install” screen appears (page 27). Click **Install**. If you want to change the installation settings, click the **Back** button and re-select the installation or Start menu locations.
7. The “Completing the Vitals Desktop Setup Wizard” screen appears (page 28). Click **Finish**.









## Upgrading from Previous Versions of Vitals

Before upgrading your version of Vitals Desktop (or the older ValveCard program), make a backup copy of your database. Copy it to another location on your PC's hard

drive, or write it to a backup device such as a CD or USB drive.

1. Locate the database file. The default location is in the directory "Program Files/Vitals/", with a file name of "vitalsdb.vcd".

2. To copy the file to another location on your hard drive, right-click on the “vitalsdb.vcd” file and select “Copy” from the menu. Go to the backup directory, right-click, and select “Paste” from the menu.
3. To copy the file to a separate backup device such as a CD or USB drive, insert the device and move the file to it as described in Step 2.




**NOTE**

If you have created other database files in Vitals Desktop, you will have to back them up as well.

4. When you install Vitals Desktop, you will be prompted for a directory to install the program. By default, it will be the same directory as the previous version of Vitals Desktop, replacing the old version. If you do not want to remove the previous version, create a new directory for the new version.

## Installing ActiveSync (Windows Mobile)

Before you can connect the Vitals controller to your PC, you need to have the Windows Mobile software installed. Use the TDS *Getting Started Disc* included with the controller to install Windows Mobile.

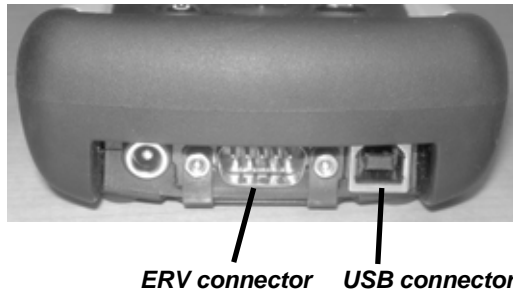
1. Insert the TDS *Getting Started Disc* into your PC’s optical disc drive.
2. If your PC has autorun enabled, the “Getting Started with Windows Mobile” window appears.
3. If you do not have autorun enabled, open the CD disc window and double-click the **Start** icon. 
4. In the “Getting Started with Windows Mobile” window, click on a language to select it and click the **Next** button.
5. Click on **Setup and Installation**. The “Install Programs for Windows Mobile” screen appears, with **ActiveSync** checked.
6. Click the **Install** button.
7. Click the **Accept** button to accept the license terms.
8. The “Installation Status” window appears. Installation may take up to several minutes.

9. When installation is complete, the checkmark icon appears and the status message reads “Installation Complete”.
10. Click the **Done** button.
11. Click the **Close** button. The “Getting Started with Windows Mobile” screen closes.
12. Eject the TDS *Getting Started Disc*.

### **Synchronizing the Controller**

After installing Windows Mobile, you need to set up synchronization to be able to transfer data between your PC and the Vitals controller. You will only need to do this the first time you connect the controller to your PC.

1. Plug the USB cable into the controller and into a USB port on your PC.



2. The “Found New Hardware” message will appear on the task bar of your computer. Wait for the driver to install.
3. The “Synchronization Setup Wizard” screen appears. Click the **Next** button.
4. The “Computer name” screen appears. You can type a name that your computer will use to recognize the controller.

### **IMPORTANT:**

If you do not uncheck the Microsoft Exchange box, any Microsoft Outlook files and settings on your PC will be transferred to the controller.

5. Uncheck the box to synchronize with Microsoft Exchange.
6. Click the **Next** button. The “Synchronization Options” screen appears.
7. Uncheck all checkboxes, then check the **Files** checkbox. The “File Synchronization” dialog box appears. Click **OK**.
8. Click the **Next** button on the Synchronization Options screen.
9. The “Completing” screen appears. Click the **Finish** button.
10. The synchronization wizard will create the Synchronized Files directory on your PC.

## **TRANSFERRING DATA BETWEEN THE CONTROLLER AND YOUR PC**

## **USING VITALS DESKTOP**

### Connecting the Controller to the PC

1. Plug the supplied USB cable into a USB port on your computer.
2. Plug the other end of the cable into the Vitals Recon controller. If the controller is off, it will sense the cable and power itself on.
3. The ActiveSync driver will load, which will take from a few seconds to a minute. When the ActiveSync window appears on your PC with the message “Connected”, the controller is ready to transfer data.

### Screen Reference

### Creating Valve Records

### Analyzing Activity Data

### Backing up the Database

### Uploading Valve Records to the Controller

### Downloading Valve Activity Data from the Controller

## **RE-INSTALLING VITALS MOBILE ON THE CONTROLLER**