Vitals Reference Manual



E.H. Wachs 600 Knightsbridge Parkway Lincolnshire, IL 60069 www.turnvalves.com



E.H. Wachs Part No. 79-MAN-04 Rev. I, August 2021

Revision History: Original December 2012 Rev. B, October 2014 Rev. C, June 2015 Rev. D, July 2017 Rev. E, November 2018 Rev. F, September 2019 Rev. G, September 2020 Rev. H, April 2021



Copyright © 2021 E.H. Wachs. All rights reserved. This manual may not be reproduced in whole or in part without the written consent of E.H. Wachs.

Table of Contents

Chapter 1: About This Manual	1
Purpose of This Manual	1
How to Use The Manual	2
Manual Updates and Revision Tracking	
	_
Chapter 2: Safety	3
Operator Safety	
Safety Symbols	
Protective Equipment Requirements	
Vitals Diagnostics	
	5
Chapter 3: Vitals Hardware and Software	9
Vitals System Architecture	
System Requirements	
Valve Operator Support and Compatibility	
TC-100 Tablet Controller with Vitals Mobile-TC	
Connection Options	
Specifications	
California Energy Commission Compliance	.4
HC-100 Handheld Controller with Vitals Mobile-HC	
Connection Options	
Specifications	5
California Energy Commission Compliance 1	6
	-
Chapter 4: Starting Up with Vitals	
Installing Vitals Desktop	
Vitals Mobile-TC	
Vitals Mobile-HC	
Foreign Language Support	24
Chanter 5: Using Vitals Mabile TC (TC 100 Cantuallar)	~
Chapter 5: Using Vitals Mobile-TC (TC-100 Controller)	
Starting Up	
TC-100 Controller Functions	
Tablet Settings 2	
Initial TC-100 Setup	
Vitals Mobile-TC Reference	2
Settings	63

	33
Adding a Valve Operator	40
Adding External GPS	
Displaying and Searching Valve Information	
Valve Operation	
Vitals Mobile Controller	
Starting a New Activity with Existing Valve	
Finding Valves on the Map	
Starting a New Activity with a New Valve	
Transducer Errors	
Vitals Mobile Diagnostics	
Brake Test	
Counter Test	
Hydraulics Test	
Transducer Zero Torque Error	
Using the Diagnostics Cable	
	••••
Chapter 6: Using Vitals Mobile-HC (HC-100 Controller)	
Starting Vitals Mobile	
Main Screen Reference	
Changing Controller Settings	
Changing GPS Settings	
ERV-750 or TM-7	
Changing Bluetooth Device Names	
External GPS	98
Vitals Mobile Controller Operation	. 103
1	
Vitals Controller	. 103
Transducer Errors	. 106
	. 106
Transducer Errors	. 106 . 108
Transducer Errors Valve Operation with Data Logging	. 106 . 108 . 108
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve Activity	. 106 . 108 . 108 . 112
Transducer Errors	. 106 . 108 . 108 . 112 . 114
Transducer Errors Valve Operation with Data Logging Starting a New Valve Activity Using GPS Search Accessing Saved Activities	. 106 . 108 . 108 . 112 . 114 . 117
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPS	. 106 . 108 . 108 . 112 . 114 . 117 . 117
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS Receivers	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 118
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS Positions	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 118 . 118
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile Notifications	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 118 . 118 . 119
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile NotificationsVitals Mobile Diagnostics	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 118 . 118 . 119 . 121
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile NotificationsVitals Mobile DiagnosticsBrake Test	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 118 . 118 . 119 . 121 . 123
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile NotificationsVitals Mobile DiagnosticsBrake TestCounter Test	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 118 . 118 . 118 . 119 . 121 . 123 . 125
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile NotificationsVitals Mobile DiagnosticsBrake TestCounter TestHydraulics Test	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 117 . 118 . 119 . 121 . 123 . 125 . 126
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile NotificationsVitals Mobile DiagnosticsBrake TestCounter TestGPS TestHydraulics TestTransducer Zero Torque Error	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 118 . 118 . 119 . 121 . 123 . 125 . 126 . 128
Transducer ErrorsValve Operation with Data LoggingStarting a New Valve ActivityUsing GPS SearchAccessing Saved ActivitiesEnabling and Using GPSGPS Status Bar Statements and Enabling GPS ReceiversLogging GPS PositionsVitals Mobile NotificationsVitals Mobile DiagnosticsBrake TestCounter TestHydraulics Test	. 106 . 108 . 108 . 112 . 114 . 117 . 117 . 117 . 117 . 118 . 118 . 119 . 121 . 123 . 125 . 126 . 128 . 130

Initial Start-Up133Database File Location134Screen Reference136Main Screen136Creating and Editing Valves and Activities139How Vitals Uses GPS Location Information139Valve Record139Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer149TC-100 Flash Transfer149TC-100 Flash Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Neivew177Uploading Large Databases182Database Setup185Customize Data Fields186Querices187Settings190Chapter 9: Ordering Information211Ordering Replacement Parts212Chapter 10: Vitals Valve Exercising Program213Jogging214Manual Mode214	Chapter 7: Using Vitals Desktop	133
Screen Reference136Main Screen136Creating and Editing Valves and Activities139How Vitals Uses GPS Location Information139Valve Record139Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Flash Transfer149TC-100 Flash Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Customize Data Fields186Queries187Chapter 8: Troubleshooting Guide193Chapter 8: Troubleshooting Guide211Printign Information211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214	Initial Start-Up	133
Main Screen136Creating and Editing Valves and Activities139How Vitals Uses GPS Location Information139Valve Record139Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer149TC-100 Flash Transfer149TC-100 Data Transfer175Data Transfer Neth HC-100 Controller168USB Flash Transfer with HC-100 Controller168Queries185Queries185Queries185Outlar Controllers Data Fields185Customize Data Fields185Queries187Vertings180Notifications190Help Options190Chapter 8: Troubleshooting Guide211Ordering Replacement Parts211Repair Information211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214	Database File Location	134
Creating and Editing Valves and Activities139How Vitals Uses GPS Location Information139Valve Record139Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Activity Report145Activity Report145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer149TC-100 Local Transfer158USB Flash Transfer175Data Transfer Review177Uploading Large Databases185Database Setup185Customize Data Fields186Queries187Settings190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Repair Information212Chapter 10: Vitals Valve Exercising Program213Jogging214	Screen Reference	136
How Vitals Uses GPS Location Information139Valve Record139Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer149TC-100 Local Transfer149TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Outeries186Queries187Settings188Notifications190Help Options211Ordering Replacement Parts211Warranty Information212Chapter 10: Vitals Valve Exercising Program213Jogging214	Main Screen	136
Valve Record139Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer149TC-100 Flash Transfer149TC-100 Local Transfer149TC-100 Local Transfer149TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214	Creating and Editing Valves and Activities	139
Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Local Transfer148TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide211Ordering Replacement Parts211Repair Information211Warranty Information212Chapter 10: Vitals Valve Exercising Program213Jogging214	How Vitals Uses GPS Location Information	139
Activity Record140Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Local Transfer148TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide211Ordering Replacement Parts211Repair Information211Warranty Information212Chapter 10: Vitals Valve Exercising Program213Jogging214	Valve Record	139
Remarks List Window141Analyzing Valve Data142Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Local Transfer149TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings190Help Options190Chapter 8: Troubleshooting Guide211Ordering Replacement Parts211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts212Repair Information212Repair Information212Repair Information212Chapter 10: Vitals Valve Exercising Program213Jogging214		
Displaying Valve/Activity Records142Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts212Repair Information212Repair Information212Repair Information212Chapter 10: Vitals Valve Exercising Program213Jogging214	Analyzing Valve Data	142
Printing145Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Setup185Customize Data Fields186Queries187Settings190Help Options190Chapter 8: Troubleshooting Guide193Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Print Detail145Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer149TC-100 Elash Transfer149TC-100 Local Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Customize Data Fields186Queries187Settings190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Chapter 10: Vitals Valve Exercising Program213Jogging214		
Activity Report146Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Flash Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214	-	
Transferring Data Between Vitals Desktop and Vitals Mobile148TC-100 Data Transfer148TC-100 Flash Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Customize Data Fields185Customize Data Fields186Queries187Settings190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
TC-100 Data Transfer 148 TC-100 Flash Transfer 149 TC-100 Local Transfer 158 USB Flash Transfer with HC-100 Controller 163 Other Controllers Data Transfer 175 Data Transfer Review 177 Uploading Large Databases 182 Database Options 185 Database Setup 185 Customize Data Fields 186 Queries 187 Settings 188 Notifications 190 Help Options 190 Chapter 9: Ordering Information 211 Ordering Replacement Parts 211 Repair Information 212 Return Goods Address 213 Jogging 214		
TC-100 Flash Transfer149TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
TC-100 Local Transfer158USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
USB Flash Transfer with HC-100 Controller163Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 9: Ordering Information211Ordering Replacement Parts211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
Other Controllers Data Transfer175Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Data Transfer Review177Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
Uploading Large Databases182Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Database Options185Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Database Setup185Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Customize Data Fields186Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Jogging214		
Queries187Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214	•	
Settings188Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Notifications190Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Help Options190Chapter 8: Troubleshooting Guide193Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214	6	
Chapter 8: Troubleshooting Guide 193 Chapter 9: Ordering Information 211 Ordering Replacement Parts 211 Repair Information 211 Warranty Information 212 Return Goods Address 212 Chapter 10: Vitals Valve Exercising Program 213 Function Overview 213 Jogging 214		
Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Chapter 9: Ordering Information211Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		102
Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214	Chapter 8: Troubleshooting Guide	193
Ordering Replacement Parts211Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214		
Repair Information211Warranty Information212Return Goods Address212Chapter 10: Vitals Valve Exercising Program213Function Overview213Jogging214	Chapter 9: Ordering Information	211
Warranty Information 212 Return Goods Address 212 Chapter 10: Vitals Valve Exercising Program 213 Function Overview 213 Jogging 214		
Return Goods Address 212 Chapter 10: Vitals Valve Exercising Program 213 Function Overview 213 Jogging 214	Repair Information	211
Chapter 10: Vitals Valve Exercising Program 213 Function Overview 213 Jogging 214	Warranty Information	212
Function Overview 213 Jogging 214	Return Goods Address	212
Function Overview 213 Jogging 214		
Function Overview 213 Jogging 214	Chapter 10: Vitals Valve Exercising Program	213
Jogging		

Chapter 11: Vitals Database Reference	215
Table Structure	215

Chapter 1 About This Manual

PURPOSE OF THIS MANUAL

This manual explains the functions of the Vitals system for valve operation and maintenance. Vitals version 3.8.1 includes the following components:

- Handheld controller (TC-100 or HC-100) for valve operation and data collection with the ERV-750, TM-7, and TM-6 valve operators.
- Vitals Mobile 3.8.1 software (and later), running on the handheld controller.
- Vitals Desktop 3.8.1 software for Window-based computers, for valve database management.

Chapter 3 describes the Vitals 3.8.1 hardware and software in detail.

When using Vitals version 3.8.1 for the first time, be sure to follow the procedures in Chapter 4, "Starting Up with Vitals". The setup procedure requires that you have a Windows (version 7, 8, or 10) PC on which you can install Vitals Desktop 3.8.1.

If you are currently running Vitals Desktop 3.7, upgrade it to version 3.8 before using Vitals Mobile 3.8 (either TC or HC version). If you have older HC-100 controllers, also upgrade them to version 3.8. You should always be running the same Vitals version on all your devices.

In This Chapter

PURPOSE OF THIS MANUAL

HOW TO USE THE MANUAL

MANUAL UPDATES AND REVISION TRACKING Throughout this manual, refer to this column for cautions and notices with supplementary information.

This symbol indicates a user notice. **Notices** provide additional information to supplement the instructions, or tips for easier operation.

Current versions of E.H. Wachs Company manuals are also available in PDF format. You can request an electronic copy of this manual by emailing customer service at <u>sales@ehwachs.com</u>.

How to Use The Manual

This manual is organized to help you quickly find the information you need. Each chapter describes a specific topic on using the Vitals controller and software.

Each page is designed with two columns. This large column on the inside of the page contains instructions and illustrations. The narrower column on the outside contains additional information such as special notes and definitions. Refer to it for safety notes and other information.

MANUAL UPDATES AND REVISION TRACKING

Occasionally, we will update manuals with improved operation or maintenance procedures, or with corrections if necessary. When a manual is revised, we will update the revision history on the title page.

You may have factory service or upgrades performed on the equipment. If this service changes any technical data or operation and maintenance procedures, we will include a revised manual when we return the equipment to you.

Chapter 2 Safety

E.H. Wachs takes great pride in designing and manufacturing safe, high-quality products. We make user safety a top priority in the design of all our products.

Read this chapter carefully before operating the valve equipment using the Vitals controller (TC-100 or HC-100). It contains important safety instructions and recommendations.

OPERATOR SAFETY

Follow these guidelines for safe operation of the equipment.

- **<u>READ THE OPERATING MANUAL.</u>** Make sure you understand all setup and operating instructions before you begin.
- <u>INSPECT MACHINE AND ACCESSORIES.</u> Before starting the machine, look for loose bolts or nuts, leaking lubricant, rusted components, and any other physical conditions that may affect operation. Properly maintaining the machine can greatly decrease the chances for injury.
- <u>ALWAYS READ PLACARDS AND LABELS.</u> Make sure all placards, labels, and stickers are clearly legible and in good condition. You can purchase replacement labels from E.H. Wachs Company.
- **<u>KEEP CLEAR OF MOVING PARTS.</u>** Keep hands, arms, and fingers clear of all rotating or moving parts.

In This Chapter

OPERATOR SAFETY VITALS DIAGNOSTICS



Look for this symbol throughout the manual. It indicates a personal injury hazard. Always turn machine off before doing any adjustments or service.

- <u>SECURE LOOSE CLOTHING AND JEWELRY.</u> Secure or remove loose-fitting clothing and jewelry, and securely bind long hair, to prevent them from getting caught in moving parts of the machine.
- <u>KEEP WORK AREA CLEAR.</u> Keep all clutter and nonessential materials out of the work area. Only people directly involved with the work being performed should have access to the area.

Safety Symbols



This icon is displayed with any safety alert that indicates a personal injury hazard.

A WARNING

This safety alert indicates a potentially hazardous situation that, if not avoided, **could** result in **death or serious injury**.

▲ CAUTION

This safety alert, with the personal injury hazard symbol, indicates a potentially hazardous situation that, if not avoided, **could** result in **minor or moderate injury**.

NOTICE

This alert indicates a situation that, if not avoided, will result in **damage to the equipment**.

IMPORTANT

This alert indicates a situation that, if not avoided, **may** result in **damage to the equipment**.

Protective Equipment Requirements



WARNING

Always wear impact resistant eye protection while operating or working near this equipment.

For additional information on eye and face protection, refer to Federal OSHA regulations, 29 Code of Federal Regulations, Section 1910.133., Eye and Face Protection and American National Standards Institute, ANSI Z87.1, Occupational and Educational Eye and Face Protection. Z87.1 is available from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.



CAUTION

Personal hearing protection is recommended when operating or working near this tool.

Hearing protectors are required in high noise areas, 85 dBA or greater. The operation of other tools and equipment in the area, reflective surfaces, process noises, and resonant structures can increase the noise level in the area. For additional information on hearing protection, refer to Federal OSHA regulations, 29 Code of Federal Regulations, Section 1910.95, Occupational Noise Exposure and ANSI S12.6 Hearing Protectors.

VITALS DIAGNOSTICS

The Diagnostics module of Vitals Mobile lets you test electronic and mechanical functions of the valve operator.

Vitals Diagnostics operates the valve operator; use the same safety precautions and procedures that you use when performing valve operations. **Do not use Vitals Diagnostics with the valve operator attached to a valve.** Run Diagnostics only in the following circumstances:

- the valve operator is powered on and in operating position;
- the valve operator is **not** attached to a valve;
- all safe operating procedures are in place. See the User Manual for your valve operator.

	HDOP 0.0 Sats 0
VIT.	ALS 3.7.0.0
New Activity	Activities
Controller	Diagnostics
My Con	npany
15 Valves 2 Modified	
3 Saved Activities	
Last Data Transfer Dat	e: 7/6/20
© 2020 E.H. Wac	hs Menu

Figure 2-1. The Diagnostics button on the main screen opens the Vitals Mobile Diagnostics program.

Vitals Mobile Diagr 👔 👫 🏹 ┥< 💷 2:37 I DIAGNOSTICS MODE V3.4.9.0 II
BOARD 103 VCD 1.0 SN N/A
MACHINE TYPE ERV-750
Connected
WARNING
MACHINE WILL OPERATE IN DIAGNOSTIC MODE. DO NOT ATTACH TO ANY VALVE OR DEVICE. FOLLOW SAFETY INSTRUCTIONS IN PRODUCT MANUAL.
I HAVE READ SAFETY INSTRUCTIONS
ΟΚ
DO NOT OPERATE VALVES
ΛΛ VITALSIM ΛΛ-
V V

Figure 2-2. The Warning screen appears when you start Vitals Mobile Diagnostics. Read all safety instructions in the valve operator manual and verify by clicking the checkbox before you continue.

Make sure that the valve operator is not attached to a valve when running Diagnostics. Keep clear of moving parts while running Diagnostics. Follow all safety procedures for using the valve operator.

Chapter 3 Vitals Hardware and Software

VITALS SYSTEM ARCHITECTURE

Figure 3-1 illustrates the Vitals 3.8.1 hardware and software architecture.

The **Vitals hardware** is a handheld control computer that operates E.H. Wachs valve exercising equipment, and stores and transfers valve operation data. There are two controller models:

- TC-100 tablet controller (introduced in 2021). Chapter 5 describes how to use the TC-100.
- HC-100 handheld controller (sold through early 2021). Chapter 6 describes how to use the HC-100.

The Vitals software has two components:

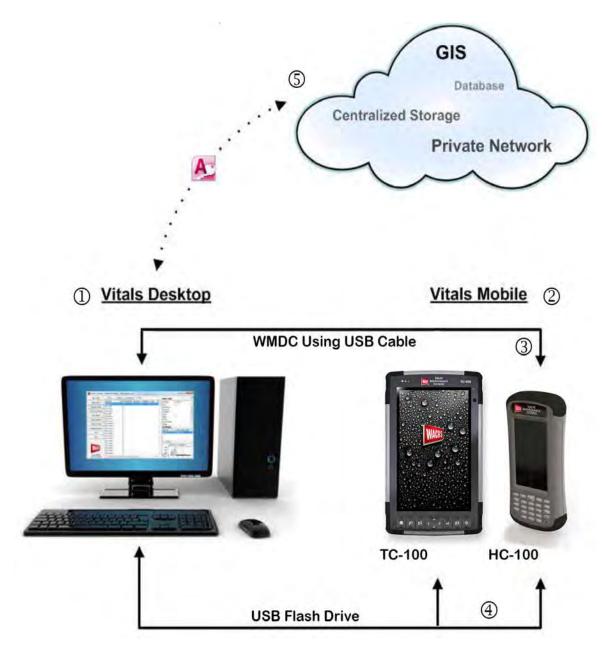
- *Vitals Desktop* runs on a Windows-based computer. Vitals Desktop lets you manage and analyze valve information and exercising data. Chapter 7 describes using Vitals Desktop.
- *Vitals Mobile* runs on the handheld controller. It operates the valve exercising equipment and logs valve exercising data.
 - The TC-100 tablet controller runs the Vitals Mobile-TC software.
 - The HC-100 handheld controller runs the Vitals Mobile-HC software.

In This Chapter

VITALS SYSTEM ARCHITECTURE

TC-100 TABLET CONTROLLER WITH VITALS MOBILE-TC

HC-100 HANDHELD CONTROLLER WITH VITALS MOBILE-HC



1. The master database resides in Vitals Desktop. Data is transferred between Vitals Mobile and Vitals Desktop during a data transfer.

2. The master database is replicated in Vitals Mobile during a data transfer. Any new valve data created in Vitals Mobile is downloaded into the master database during a data transfer.

3. Connection between Vitals Mobile-HC and Vitals Desktop can be made with the optional docking station or a wired USB connection, using Windows Mobile Device Center (WMDC).

4. USB flash drive transfer can be initiated from either the TC-100 or HC-100. Activity data is transferred to the Vitals Desktop database; the updated database is then transferred by flash drive back to the controller.

5. Data collected through the Vitals software suite can be exported from Vitals Desktop to your choice of GIS software, private network, or any other location, by your IT or GIS team. (This functionality is not supported by E.H. Wachs.) Vitals database is stored in Microsoft Access format. See Appendix B for Vitals database technical information.

Figure 3-1. The diagram illustrates the Vitals software and hardware architecture.

System Requirements

Vitals Desktop requires a Windows PC running Windows 7, 8, or 10, with a USB port. The PC USB port is used to connect to the Vitals controller, or to connect to a flash USB drive for Flash Transfer.

Vitals Mobile-TC runs on the TC-100 Tablet Controller. The TC-100 is a Windows 10 Pro tablet with Vitals software installed to control E.H. Wachs equipment and manage valve data.

Vitals Mobile-HC runs on the HC-100 handheld controller. The HC-100 is a Windows Embedded Handheld device for operating E.H. Wachs equipment. Vitals Mobile-HC is also compatible with older controllers such as the Trimble Recon.

Valve Operator Support and Compatibility

The Vitals controllers running Vitals 3.8.1 are compatible with the following Wachs valve operators. Table 3-1 describes feature support for each valve operator.

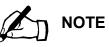
- ERV-750
- TM-7
- TM-6

Feature	ERV-750	TM-7	ТМ-6
Manual/emergency valve operation	Yes	Yes	Yes
Automatic "No-assumption" valve exercising	Yes	Yes	Yes
Data logging	Yes	Yes*	Yes*
Bluetooth communication (requires Bluetooth module on valve operator)	Yes	Yes*	Yes*
Vitals Mobile Diagnostics	Yes	Yes**	Yes**

Table 3-1: Vitals Mobile 3.8.1 Feature Support

* May require board upgrade on older valve operators; contact E.H. Wachs with serial number for information. ** Not applicable for older TM-7/TM-6 units with silver/yellow controller boxes.

Vitals Desktop 3.8.1 should be compatible with Windows Vista and XP. However, this has not been tested and is not supported, and E.H. Wachs does not guarantee compatibility. E.H. Wachs follows Window's lifecycle support guidelines.



There is a known issue with Windows Mobile Device Center (WMDC) in Windows 10. The handheld controller may not connect to your Windows 10 computer until you enable WMDC. See "HC-100 not recognized when connected to PC" on page 193 in the Troubleshooting chapter.

TC-100 TABLET CONTROLLER WITH VITALS MOBILE-TC

The TC-100 is a tablet computer running the Windows 10 Pro operating system. It is waterproof, dustproof, and can be used in temperatures from -4° F to $+122^{\circ}$ F (-20° C to $+50^{\circ}$ C). The TC-100 has integrated GPS and Bluetooth connectivity. See specifications below.

You can use an external GPS unit for higher-resolution mapping. Input requires NMEA-0183 data format, using Bluetooth.



Figure 3-2. The TC-100 handheld controller is a fully functional Windows 10 Pro computer, running Vitals Mobile software.

Connection Options

Connection between the TC-100 and E.H. Wachs valve operating equipment is made using either the included 79-302-30 Machine Control Cable or the embedded wireless Bluetooth communication in the TC-100 (requires Bluetooth-equipped valve operator). You can transfer valve and activity data between the TC-100 and your PC running Vitals Desktop using a USB flash drive. You can also set up the TC-100 on your network; see your IT person/department for assistance. The TC-100 operates as a fully functional Windows 10 Pro tablet PC.

Specifications

Operating System	Microsoft Windows 10 Pro
Processor	Quad-core Intel Pentium N4200
Memory	8 GB RAM
Storage Memory	128 GB. Expansion with Micro SD/SDXC slot.
Display	800 x 1280, 7" backlit LCD
Battery Life	Up to 12 hours (may be reduced running GPS)
Battery Charging	4-6 hours to full charge
Ports	Data: USB 3.0 host (full A), 3.5 mm audio jack. Power: 10-15.5 V, nominal 12 VDC.
Cameras	8 MP rear and 2 MP front
Wireless connectivity	Bluetooth 5.0 long range wireless. Wi-Fi 801.11a/b/g/n/ac 2.4 GHz and 5 GHz
GPS	u-blox NEO-M8N GNSS with 72 tracking chan- nels.
Size and weight	5.4" w x 8.48" l x 1.36" d (137 mm x 215 mm x 35 mm). 1.73 lb (770 g) with battery.
	Operating: -4°F to +122°F (-20°C to +50°C)
Temperature	Storage: -22°F to +158°F (-30°C to +70°C)
	Charging: 32°F to +122°F (0°C to +50°C)
Environmental	IP68 waterproof and dustproof
Drop	Shockproof: multiple drops from 4' (1.2 m) onto concrete

Table 3-2: TC-100 Hardware Specifications



The "BC" symbol on the cover of this manual signifies CEC compliance.



The Bluetooth module is rated for operation from $-4^{\circ}F$ to $+122^{\circ}F$ ($-20^{\circ}C$ to $+50^{\circ}C$).

California Energy Commission Compliance

The battery charger supplied with the TC-100 has passed testing required by California Code of Regulations Title 20, using Test Method 10 CFR Section 430.23(aa) (Appendix Y to Subpart B), June 2016. Information on the charger's certification is available at:

https://cacertappliances.energy.ca.gov/Pages/Appliance-Search.aspx

(No hyphen.) Search for company "Juniper Systems", model "TC-100".

HC-100 HANDHELD CONTROLLER WITH VITALS MOBILE-HC

The HC-100 is a ruggedized handheld computer running the Windows Embedded Handheld operating system. It is waterproof and can be used in temperatures from -22° F to $+140^{\circ}$ F (-30° C to $+60^{\circ}$ C). The HC-100 has integrated GPS and Bluetooth connectivity. See specifications below.

You can use an external GPS unit for higher-resolution mapping. Input requires NMEA-0183 data format, using either Bluetooth or an RS-232 cable.

Connection Options

Connection between the HC-100 and E.H. Wachs valve operating equipment is made using either the included 79-302-10 Machine Control Cable or the embedded wireless Bluetooth communication in the HC-100 (requires optional Bluetooth module installed, and may require board upgrade on older TM machines).

The HC-100 connects to the PC running Vitals Desktop using a USB connection. You can connect the HC-100 directly to the PC USB port (using Windows Mobile Device Center), or transfer data using a USB flash drive.



Specifications

Table 3-3: HC-100 Hardware Specifications

Operating System	Microsoft Windows Embedded Handheld
Processor	1.0 GHz ARM Cortex A8 i.MX53
RAM	512 MB
Storage Memory	8 GB
Display	800 x 480, 4.3" WVGA LCD TFT
Battery Life	Up to 20 hours (may be reduced when running GPS)
Battery Charging	2-4 hours to full charge
Ports	Data: USB host (full A), USB client (Micro B), RS-232 9-pin. Power: 12, 24 VDC input, 10-36 V unregulated.
Wireless connectivity	Bluetooth wireless, 2.1 +EDR, Class 1.5, range greater than 100 ft (30 m). Wi-Fi 801.11b/g/n.
GPS	High-sensitivity GPS/GLONASS/SBAS
Size and weight	3.6" w x 7.25" l x 1.5" d (91 mm x 184 mm x 38 mm). 1.3 lb (590 g) with battery.

An optional desktop dock (79-110-09), shown in the photo, is available to provide power and USB connection to the HC-100. The dock also has an Ethernet jack for connecting to a network.



The "BC" symbol on the cover of this manual signifies CEC compliance.

Operating System	Microsoft Windows Embedded Handheld
Temperature	Operating: -22°F to +140°F (-30°C to +60°C)
Temperature	Storage: -22°F to +158°F (-30°C to +70°C)
Environmental	IP68 waterproof and dustproof
Drop	Shockproof: multiple drops from 5' (1.5 m) onto concrete

Table 3-3: HC-100 Hardware Specifications

California Energy Commission Compliance

The battery charger supplied with the HC-100 has passed testing required by California Code of Regulations Title 20, using Test Method 10 CFR Section 430.23(aa) (Appendix Y to Subpart B), June 2016. Information on the charger's certification is available at <u>https://cacertappliances.energy.</u> ca.gov/Pages/ApplianceSearch.aspx, company "Juniper Systems", model "AR2".

Chapter 4 Starting Up with Vitals

You will need Internet access to download the Vitals installation file. You will also need a USB port to connect to the HC-100 controller.

There are two steps to start up the Vitals 3.8.1 software. You must perform them in this order:

- 1. **Install Vitals Desktop**. Run the Vitals 3.8.1 installer on your Vitals Desktop Windows PC (Windows 7, 8, or 10). (You can download the installer from the Wachs Utility website at **www.turnvalves.com**.
 - If you already have Vitals Desktop installed, down-load and run the installer to update it to Version 3.8.
- 2. Initializing Vitals Mobile.
 - For the TC-100 controller, start up and configure your Windows account on the tablet. The *TC-100 Quick Setup Guide* included with your controller has a link to detailed instructions on the Wachs Utility website.
 - Connect the HC-100 controller to your PC, using the supplied USB cable, and follow the instructions in the "Installing Vitals Mobile" section below.

In This Chapter

WHAT'S INCLUDED INSTALLING VITALS DESKTOP VITALS MOBILE-TC VITALS MOBILE-HC FOREIGN LANGUAGE SUPPORT



Before running the installer, transfer any activities saved on the handheld controller to the Vitals database. See "Transferring Data Between Vitals Desktop and Vitals Mobile" on page 148.

WHAT'S INCLUDED

The Vitals Desktop 3.8.1 installer includes the following files:

- Vitals Desktop application
- Vitals Reference Manual PDF
- Language pack files
- Windows Mobile Device Center installation files
- Vitals Mobile-HC installation CAB file
- Vitals Mobile-TC installation MSIX file.

INSTALLING VITALS DESKTOP

- **1.** Run the downloaded installer file. The Setup Wizard should begin automatically.
- **2.** The **Select Setup Language** window appears. Choose a language from the dropdown list and click **OK**.

P	Select the language to use during the installation:
	English
	OK Cancel

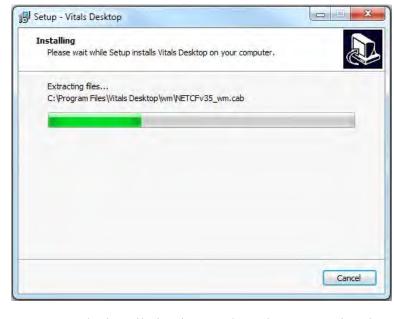
- **3.** The Setup Vitals Desktop window appears. Click Next to continue.
- The Vitals Installer Options window appears. To proceed with the Vitals installation, select Install Vitals
 3.8.1 Software and click Next. You can also choose to view the Vitals Reference Manual from this screen.
- **5.** The Information window appears. Read through the Change Log and New Features to familiarize yourself with Vitals 3.8.1. Click Next to continue.
- **6.** The **Select Start Menu Folder** window appears. Choose a location for the Vitals shortcut, or click **Next** to install the shortcut to its default location.

Select Start Menu Folder Where should Setup place the program	m's shortcuts?
Sature will greate the program	n's shortcuts in the following Start Menu folder.
in the second se	
To continue, click Next. If you would li Nitals Desktop	ike to select a different folder, click Browse.
Mitors pression	browse

7. The Ready to Install window appears, showing the location of the Vitals Desktop Start Menu shortcut. (Another Vitals Desktop shortcut will be provided on the user's desktop.) Click Next.

Ready to Install	A DESCRIPTION OF THE REAL OF T
Setup is now ready to begin installing	g Vitals Desktop on your computer.
Click Install to continue with the insta change any settings.	allation, or click Back if you want to review or
Start Menu folder: Vitals Desktop	(*
viais beakup	
+	F
	And the second second

8. The **Installing** window appears, showing the progress of the installation along with a list of files that are installed.



9. Once the installation is complete, the Setup Wizard will confirm that the installation has completed and Vitals Desktop has been installed. Click **Finish**. The Vitals Desktop software is now ready to use.



VITALS MOBILE-TC

Vitals Mobile-TC comes pre-installed on the TC-100 controller. As newer versions of Vitals Mobile-TC become available, they can be installed through the Settings screen in the application.

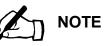
VITALS MOBILE-HC

Use this procedure for software installation if you have the HC-100 handheld controller.

Vitals Mobile-HC comes pre-installed on the HC-100 controller. As newer versions of Vitals Mobile-HC become available, they can be installed using the following procedure. (When there is a newer version of Vitals Mobile-HC, you will be prompted to install it on the HC-100 during a Data Transfer.) It is recommended to have the same versions of Vitals Mobile-HC and Vitals Desktop software.

You must have Vitals Desktop installed on your PC to perform the installation.

- **1.** Connect the HC-100 to the PC using the supplied USB cable.
- **2.** If the controller is off, turn it on by pressing the Power button.
- **3.** Windows Mobile Device Center should open on the PC.



If Windows Mobile Device Center doesn't open, see "Problems with Windows Mobile Device Center" in Chapter 7, Troubleshooting.



Figure 4-1. Windows Mobile Device Center will recognize the HC-100 controller.

- **4.** Start the Vitals Desktop application.
- **5.** In the Vitals Desktop menu, click **Data Transfer**. The **Data Transfer** dialog box should open. Click **START**.

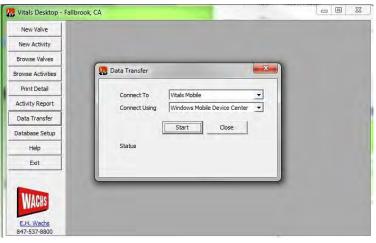


Figure 4-2. Click **Start** *when the* **Data Transfer** *dialog appears.*

- **6.** Vitals Desktop detects whether the controller has Vitals Mobile installed (including updates to the latest version). Click **Yes** to install Vitals Mobile.
- 7. The HC-100 screen shows the installation progress. IMPORTANT: Do not quit Vitals Desktop on the PC, or turn off the HC-100, during installation.



Once the installation starts, do not cancel it or close Vitals. You could lose activity data.

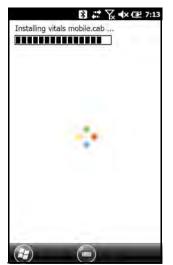


Figure 4-3. The HC-100 screen displays the installation progress.

8. A message confirms that the installation was successful.

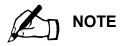


Figure 4-4. The HC-100 shows when the Vitals installation is complete.

- **9.** After Vitals Mobile successfully installs on the controller, click the **OK** button in Vitals Desktop.
- **10.** Vitals Desktop will sync the database on the HC-100. Click the **Close** button when data transfer is complete.



Once the data transfer starts, do not cancel it or close Vitals. You could lose activity data.

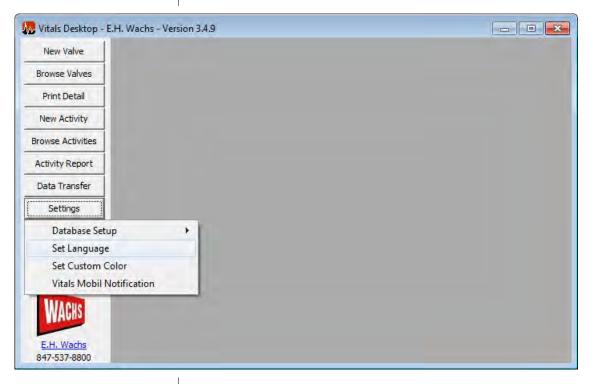


Vitals Mobile-TC does not currently include foreign language support.

FOREIGN LANGUAGE SUPPORT

Foreign languages are supported by first installing the language file on the Vitals Desktop PC. During a Data Transfer, the available languages are pushed out to the Vitals Mobile.

- **1.** Make sure the new language filename is in the format **strings.Language.txt**, where "**Language**" is the name of the language into which the file has been translated.
- 2. Copy the language file into the following directory on your computer: C:\Program Files\Vitals Desk-top\strings.
- **3.** Open Vitals Desktop and select **Settings >> Set Language**. Confirm that the new language has been added to the Vitals software.



4. A language in Vitals Desktop will be automatically uploaded to Vitals Mobile during a Data Transfer. To change the Vitals Mobile operating language, simply perform a Data Transfer while using the desired language on Vitals Desktop.

- In Vitals Desktop, some languages will require a change to the Administrative System Locale under the Region and Language settings on your Windows system in order to view special characters properly.
- Certain languages are not available in the Locale Settings on Windows Mobile devices. In order to view special characters for these languages, a language-specific firmware version is required.
- In order to easily input special characters for certain languages, third-party input software may be installed.

Chapter 5 Using Vitals Mobile-TC (TC-100 Controller)

The TC-100 tablet controller runs the Vitals Mobile-TC software. Vitals Mobile-TC operates the valve exerciser and stores valve exercising data. You can transfer valve records from your PC running Vitals Desktop to the controller, or enter valve records using Vitals Mobile-TC while in the field.

This chapter assumes you are familiar with how to operate a touchscreen tablet computer—including interface features such as tapping to select icons or data fields, touching and dragging icons on the screen, "swiping" on the screen, and typing with an on-screen keyboard.

STARTING UP

The *TC-100 Quick Setup Guide* is included in the box with the TC-100. Refer to this guide when unpacking and starting the tablet. The guide shows how to charge and configure the TC-100. The *Quick Setup Guide* includes a link to detailed instructions for Windows 10 setup on the Wachs Utility website.

TC-100 Controller Functions

The TC-100 tablet has a panel of control buttons below the screen.

In This Chapter

STARTING UP

DISPLAYING AND SEARCHING VALVE INFORMATION

VALVE OPERATION

VITALS MOBILE DIAGNOSTICS



Figure 5-1. TC-100 connections and control buttons

An optional dock is available. You can mount the TC-100 in the dock to charge and connect it to a wired network. The docking connector is on the left side of the tablet; it docks in landscape mode.

Press the TC-100 down onto the dock until it snaps in place. To remove it, press the release button on the front of the dock.

Tablet Settings

Swipe from the right edge of the screen toward the middle to display the Notifications and Device Settings menu.

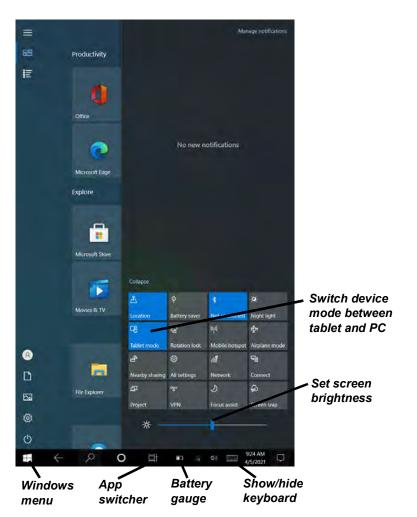


Figure 5-2. The figure shows the Notifications and Device Settings menu. Swipe from the right edge to show and hide the menu.

Tap on the left side of the screen or swipe again from the right to hide the settings.

Initial TC-100 Setup

The TC-100 functions as a standard Windows 10 Pro computer. Initial setup is the same as for a new PC. Consult with your IT person or department for assistance, if necessary. The TC-100 can be used as a non-networked, standalone device with a single user account for running the Vitals software. However, you will probably want to set up networking features such as wi-fi, file sharing, email, etc, to incorporate it into your office network.

- **1.** Press the power button on the TC-100 tablet. You'll be prompted for Windows configuration information, including a user account.
- 2. When you login to your account, tap in the **Password** field to display the keyboard. Type in your tablet's password and tap the forward arrow to log in.



Figure 5-3. Tap the password field and type in the password to login.

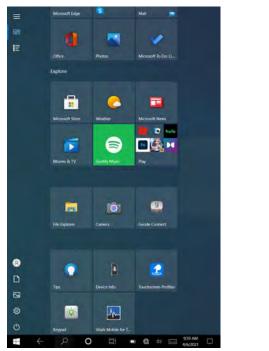


Figure 5-4. TC-100 initial screen in tablet mode. Scroll down to locate the Vitals Mobile icon.

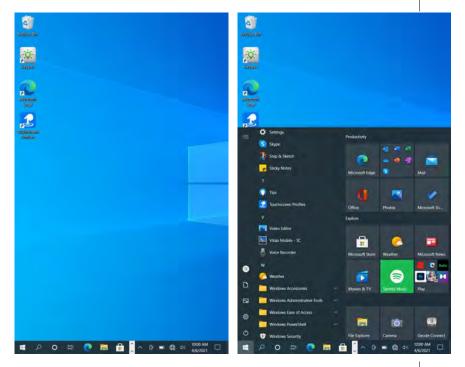


Figure 5-5. TC-100 initial screen in PC mode (left). Tap the Windows icon (right) and scroll down to locate the Vitals Mobile icon.



On a new TC-100 with no Vitals data, the Query results will be blank.

Vitals Mobile-TC Reference

1. Tap the Vitals Mobile-TC icon. The app appears with the home page and All Activities Query results displayed.

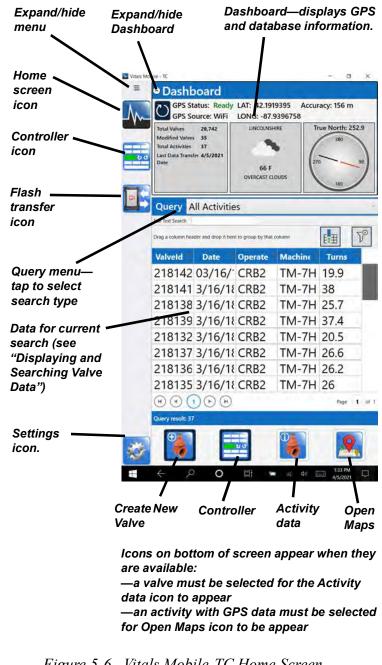


Figure 5-6. Vitals Mobile-TC Home Screen

- **2.** Use the menu icons on the left to access the main program functions:
- Home Screen with valve and activity data

- Controller, for operating the TM or ERV-750 valve operator
- Flash transfer, for transferring activity data to Vitals Desktop.
- Settings, for changing program defaults.

Settings

Tap the Settings icon to open the Vitals Mobile-TC settings screen. The default view is the **Connection** tab.

Touch any of the tabs to view that Settings screen.

Connection Tab

1. A list of paired machines appears on the Connection tab under **MY EQUIPMENT**. If multiple machines appear in the list, tap to select the one you want to use.



Figure 5-7. Connection Settings. A list of paired valve operators appears under MY EQUIPMENT. Tap the name to make it active under MY CONNECTION. (Only one is active at a time.)

2. You can set the default torque limit under MY CONNEC-TION. (This sets the torque limit for Vitals Mobile-TC, not for the selected valve operator. The torque level you select will be saved for all valve operations until you change it again.)



Figure 5-8. Set the Default Torque Limit for Vitals Mobile-TC using the drop-down menu.

- **3.** Tap **MANAGE EQUIPMENT** to pair or unpair valve operators.
- See "Adding a Valve Operator" on page 40 for connecting to new equipment.

Connection GPS Dashboar Possible Connections Found. WACHS ERV-750-6788E9 is on. MY CONNECTION EH. WACHS ERV-750-6788E9 Image: Constraint of the state of the st
H. WACHS ERV-750-6788E9 is on. MY CONNECTION EH. WACHS ERV-750-6788E9 B C 106 Default Torque Limit 150
EH. WACHS ERV-750-6788E9 8 @ 106 Default Torque Limit 150 -
ERV-750-6788E9 106 Default Torque Limit 150
MY EQUIPMENT EH. WACHS ERV-750-6788E3
E.H. WACHS ERV-750-6788E3
EH, WACHS

Figure 5-9. Pair and unpair machines under the **MANAGE EQUIPMENT** *list.*

<u>GPS Tab</u>

See "Adding External GPS" on page 43.

- **1** Tap the **GPS** tab.
- 2. Use Auto-discover serial port to search for an available GPS device, or manually select a device with the Serial port drop-down.

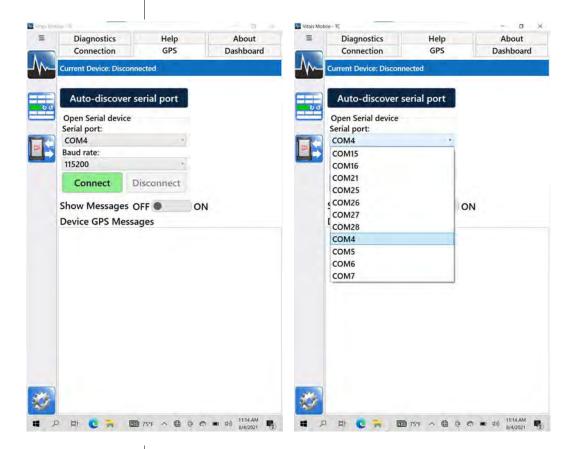


Figure 5-10. Use the GPS tab to connect to an external GPS device. Either click Auto-discover serial port, or select the serial port manually.

3. Tap the **Show Messages** toggle button to turn GPS message display on or off.

Dashboard Tab

- **1** Tap the **Dashboard** tab.
- 2. Tap the Select Query drop-down to select any of the Home Screen data queries. Then tap to select the fields you want to list on the Home Screen.
- You can arrange the order of the fields by dragging them on the Home Screen.
- Select a limited number of fields for display. If there are more than 3-5 fields displayed, the columns will be too narrow to read.
- You can see the rest of the valve and activity data by selecting the specific record on the Home Screen.
- **3.** After selecting the fields for the query, tap the Save icon.

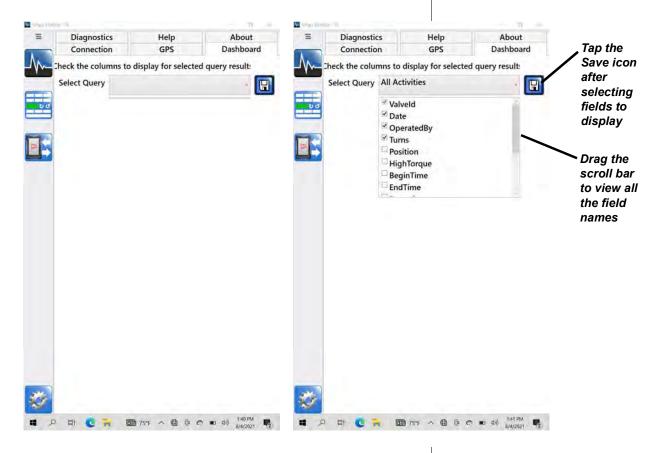


Figure 5-11. Dashboard Setting tab. Select a query to choose the fields for display.

<u>Help Tab</u>

- **1**. Tap the **Help** tab.
- **2.** The Help reference screen for Vitals Mobile-TC appears.
- 3. Tap Vitals Manual to access this manual from the turnvalves.com website. The manual is in PDF format. You can save it to your TC-100 device after downloading it.

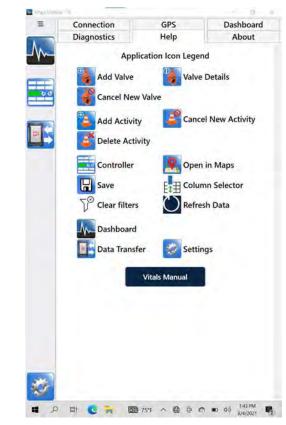


Figure 5-12. Vitals Mobile-TC Help reference screen.

About Tab

- **1** Tap the **About** tab.
- 2. The About tab displays device and software version information. You can tap Check for Update to see if a newer version of Vitals Mobile-TC is available.
- You should back up your data using the Flash Transfer function before updating the software.
- If you choose to install the update, you will be prompted to start the download. Once the download is complete, you will be prompted to run the installer for the new software version.
- **3.** Exit and restart Vitals Mobile-TC after performing the software update.

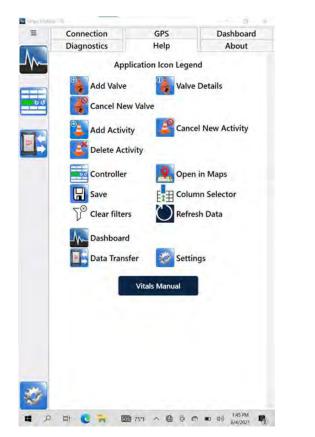


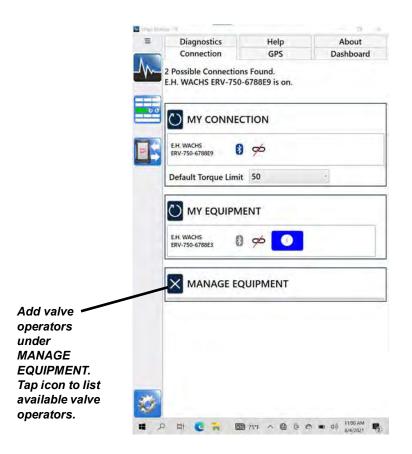
Figure 5-13. The About tab shows version information and allows you to update Vitals Mobile-TC.

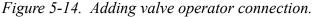
Adding a Valve Operator

Add a connection to a valve operator in Settings, under the Connection tab.

Before connecting to a valve operator, turn its power on.

1. Tap the Vitals Mobile-TC Settings icon. The **Connection** tab appears by default.





2. Tap the icon for **MANAGE EQUIPMENT** to display available valve operators (both paired and unpaired). Make sure the valve operator is turned on.

	Ser ata Alic	Berri II.	-		- 7
	=	Diagnostics	н	elp	About
		Connection	G	iPS	Dashboard
	-//~-	One Possible Cor E.H. WACHS ERV			
	0.0		NECTION		
	E:	E.H. WACHS ERV-750-6788E3	co 🚯	105	
		Default Torque	Limit 150		~
			IPMENT E EQUIPMI	ENT	
The MANAGE		E.H. WACHS ERV-750-6788E3	0		
EQUIPMENT sec- tion displays		E.H. WACHS ERV-750-6788E9	0	PAIR	
paired and unpaired valve operators within range.					
	Ø				
		P O 🖽 💽	🕞 👌 i	- A 10 6	ali) 1242 PM

Figure 5-15. Display available valve operators under **MANAGE EQUIPMENT**.

3. Tap the **PAIR** button for the valve operator you want to connect to. A **Scanning...** message appears on the **MY CONNECTION** and **MY EQUIPMENT** sections while the connections are updated.



Figure 5-16. When you pair a new valve operator, connection information is updated.

4. The updated connections are listed. To change the active connection, select the new valve operator under **MY EQUIPMENT**.

Diagnostics	Help	About	E Diagnostics	Help	About
Connection	GPS	Dashboard	Connection	GPS	Dashboard
One Possible Connect E.H. WACHS ERV-750				ctions Found. -750-6788E9 is on.	
	TION			NECTION	
E.H. WACHS ERV-750-6788E3	96		E.H. WACHS ERV-750-6788E9	8 90	
Default Torque Limit	150	-	Default Torque	Limit 50	
	ENT		MY EQU	IPMENT	
	UIPMENT		E.H. WACHS ERV-750-6788E3	8 🕫 🚺	
E.H. WACHS ERV-750-6788E3				E EQUIPMENT	
E.H. WACHS ERV-750-6788E9	Lanta				
<u></u>					
			-		

Figure 5-17. To change the connection, tap the new valve operator under **MY EQUIPMENT**.

Adding External GPS

Before this procedure, make a Bluetooth connection from the TC-100 to the GPS device, as described above.

- **1** Turn on the GPS device and locate it close to the TC-100.
- 2. Open Vitals Mobile-TC. Tap the Settings icon and then tap the GPS tab.
- **3.** Tap **Auto-discover serial port**. Vitals Mobile-TC will scan the available serial ports until it finds the GPS device.
- **4.** You can also connect manually, by selecting a COM port and choosing the required baud rate for your GPS device.

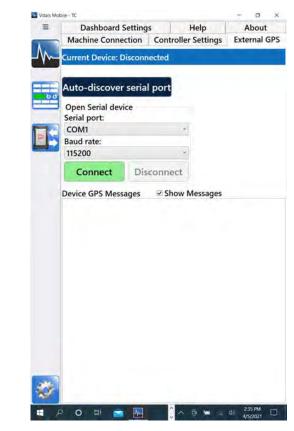


Figure 5-18. Use the Auto-discover serial port button to find the GPS device,

5. Tap **Connect**. When the connection is complete, return to the Home screen or start a valve activity.

DISPLAYING AND SEARCHING VALVE INFORMATION

You can sort and display valve and activity data on the Home screen.

1. When you open Vitals Mobile-TC, the Home screen appears with Query results for All Activities.



You can hide the Dashboard to create more room to display valve data.

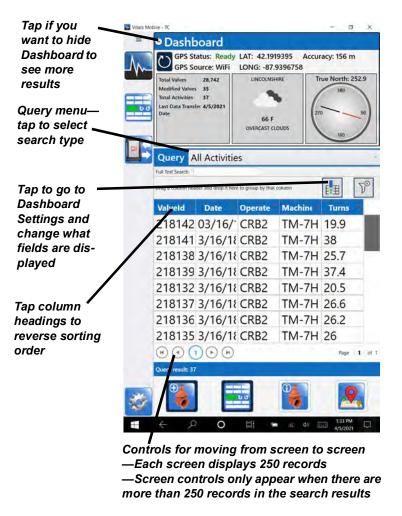


Figure 5-19. Vitals Mobile-TC Home Screen

Dashb	oard		- 0	× Vitals M	• Dashbo	oard		- 0
Query Al	Activities			•		tus: Initializing Irce: Internal		
Full Text Search All	Activities				Total Valves	28,742		True North:
Drag a column All	Valves				Modified Valves Total Activities	35 37		360
Valvel All	Activities +	History		00		Section and a section of the section		210
21814	GPS data							1
21814T	tivities with CRB2	GPS info 3/10/18	38	- 57				180
218138	CRB2	3/16/18	25.7		Query Al	Activities		
218139	CRB2	3/16/18	37.4		Full Text Search			
218132	CRB2	3/16/18	20.5		Drag a column heade	r and drop it here to grou	p by that column	EIE
218137	CRB2	3/16/18	26.6		Valveld	Date	tedB T	Turns
218136	CRB2	3/16/18	26.2		218142	03/16/18		19.9
218135	CRB2	3/16/18	26		218141	3/16/18	CRB2	38
218130	CRB2	3/16/18	20.4		218138	3/16/18	CRB2	25.7
218140	CRB2	3/16/18	26.2		218139	3/16/18	CRB2	37.4
218131	CRB2	3/16/18	20		218132	3/16/18	CRB2	20.5
218134	CRB2	3/16/18	26		218137	3/16/18	CRB2	26.6
218133	CRB2	3/16/18	26		218136	3/16/18	CRB2	26.2
218129	CRB2	3/16/18	19.8		218135	3/16/18	CRB2	26
001			Page	1 of 1	001			Page
Query result: 37					Query result: 37			

2.

Figure 5-20. Tap the Query menu to select the data search (left). You can move the columns in the list by dragging the column headers left or right (right).

To change the Query type, tap on the Query menu and

- All Activities—lists all activity records stored on the TC-100. You can select fields for display in the Dashboard Settings.
- All Valves—lists all valve records stored on the TC-100. You can select fields for display in the Dashboard Settings.
- All Activities + History—lists activities with ValveID, Date, OperatedBy, and Turns fields.
- All GPS Data—lists valve records that have GPS data, with Latitude, Longitude, ValveID, Dist. from, and Head-ing.
- Activities with GPS info—lists valves that have activities with GPS data, with Latitude, Longitude, ValveID, Dist. from, and Heading.

3. Tap on an activity to highlight it. The Valve Details icon will highlight to show valve information is available.

g a column heade	er and drop it here to gro	up by that column	EI T	₽ <mark></mark> • \	/alve 218138
Valveld	OperatedB	Date	Turns	0.0	
18142	CRB2	03/16/18	19.9	•	Activity 3/16/18
18141	CRB2	3/16/18	38		
18138	CRB2	3/16/18	25.7		History 4/26/2010
18139	CRB2	3/16/18	37.4		
18132	CRB2	3/16/18	20.5		History 9/11/2016
18137	CRB2	3/16/18	26.6		History 8/11/2016
18136	CRB2	3/16/18	26.2		
18135	CRB2	3/16/18	26		
18130	CRB2	3/16/18	20.4		
18140	CRB2	3/16/18	26.2		
18131	CRB2	3/16/18	20		▼
18134	CRB2	3/16/18	26		
18133	CRB2	3/16/18	26		
18129	CRB2	3/16/18	19.8		
000			Page 1	of 1	
ery result: 37					

Highlighted to show data is available

To return to the search results screen, tap the Home icon.

Figure 5-21. Select an activity in the list, and tap the Valve Details icon to display the valve data.

alve 2181	38	• Valve 218	3138	• Valve 218	138
lveld	218138	• Activity	y 3/16/18	• Activity	/ 3/16/18
cation		Valveld	218138	• History	4/26/2010
otes		Date	3/16/2018	Valveld	218138
		OperatedBy	CRB2	Date	4/26/2010
e	8	Machine	TM-7HD		Arotron
pth	2.5	Turns	25.7	OperatedBy	TM-7HD
itDate	1/1/0001	Position	Open	Machine	
tallDate	1/1/0001	HighTorque	75	Turns	26.2
ormTurns	0	BeginTime	07:33 AM	Position	

4.

Figure 5-22. Tap the heading to display the available data.

5. Tap **More Info** to display the torque chart, if one is available.

Tap on the headings to expand the data records.

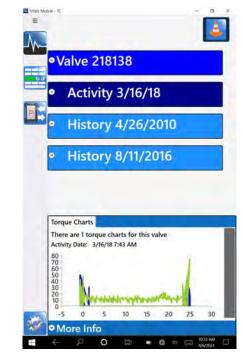


Figure 5-23. More Info displays the torque chart.

6. You can group data by any of the displayed fields. Drag the field heading up into the Sort box.

	is: Initializing ce: Internal			\mathbf{M}	GPS Status: Init GPS Source: Inte			
otal Valves 3 Aodified Valves 3 otal Activities 3 ast Data Transfer 4 late	17		True North: 254.3		Total Valves 28,742 Modified Valves 35 Total Activities 37 Last Data Transfer 4/6/2921 Date		True North: 254.4	
Query All	Activities			E:	Query All Activ	ities	-	
ull Text	Search	-			Full Text Sear	ch		
orag a	Reten Tea	ler and d	ror Bahe To		Grouped by:	Date +	EE TO	
Valveid	Date	OperatedB	Turns			Date OperatedE	Turns	
18142	03/16/18	CRB2	19.9		*03/16/18			Tap the F
18141	3/16/18	CRB2	38		218142 03	3/16/18 CRB2	19.9	icon to r
18138	3/16/18	CRB2	25.7		-03/20/18			the sort
18139	3/16/18	CRB2	37.4		03/22/18			
18132	3/16/18	CRB2	20.5		~ 03/28/18		1	
18137	3/16/18	CRB2	26.6		3/16/18			
18136	3/16/18	CRB2	26.2		~ 3/20/18			
000	() ()	CDDO	Page 1 of 1		······································	Ð	Fage 1 of 1	
	00				Query result 37	Q.		
very result: 37					docth terms at			

Figure 5-24. You can drag any of the field headers up into the Sort box to group the data (Date field shown).

7. You can drag multiple field headings into the sort box.

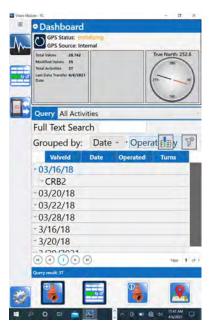


Figure 5-25. Group by multiple fields.

8. You can search within your query results by typing in the Full Text Search box. All displayed fields are searched. Results are updated as you search.

Querry	All Activities		
M-			-
Full Tex	xt Search C	ir 🛃	
Drag a	column hea	ader and o	drop
Valveld	Date	OperatedB	1 Turns
218142	2 03/16/18	B CRB2	19.9
21814	1 3/16/18	CRB2	38
218138	3/16/18	CRB2	25.7
218139	9 3/16/18	CRB2	37.4
218132	2 3/16/18	CRB2	20.5
218137	7 3/16/18	CRB2	26.6
218136	5 3/16/18	CRB2	26.2
21813	5 3/16/18	CRB2	26
218130	3/16/18	CRB2	20.4
218140	3/16/18	CRB2	26.2
21813	1 3/16/18	CRB2	20
218134	4 3/16/18	CRB2	26
218133	3 3/16/18	CRB2	26
21012	2 2145140		10.0
Θ		_	Page
Query result:	37		
•		0	

Figure 5-26. Type in the Full Text Search box to search the displayed results.

9. When you select an activity or valve with GPS data, the Maps icon is highlighted. Tap the icon to open Maps and display the valve location.

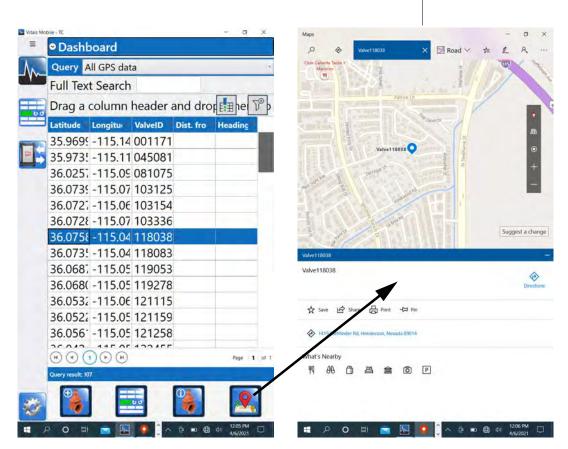
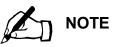


Figure 5-27. When the Maps icon is highlighted, you can tap it to display the valve location in Maps.

- Maps is a separate app. You will have to return to Vitals Mobile-TC to continue.
- **10.** From your search results, you can select valves and proceed to valve operation. See "Starting a New Activity with Existing Valve" on page 54.



Live Maps data are available only when the TC-100 is online (connected to wi-fi or a mobile hotspot). To use Maps without an internet connection, download your local map. Tap the Windows icon, go to Settings, then Apps>Offline Maps. Find your location and download the map.

E.H. Wachs "No-Assumption" Valve Exercising

When you run the valve operator in EXER mode, it uses the "no-assumption" exercising protocol to determine direction of valve rotation.

Refer to Appendix A for a detailed description of the no-assumptions protocol.

VALVE OPERATION

Vitals Mobile Controller

The Vitals Controller is the program for operating E.H. Wachs valve operators. If using a cable connection, make sure the control cable is connected to the USB or serial port on the controller and to the port on the valve exerciser. If using a Bluetooth connection, make sure a Bluetooth module is properly installed and that the Bluetooth settings on the controller have been properly set up.

1. On the Vitals Mobile screen, tap the Controller button. The Controller screen appears. If a valve or activity was selected on the Home screen, that valve is selected by default.

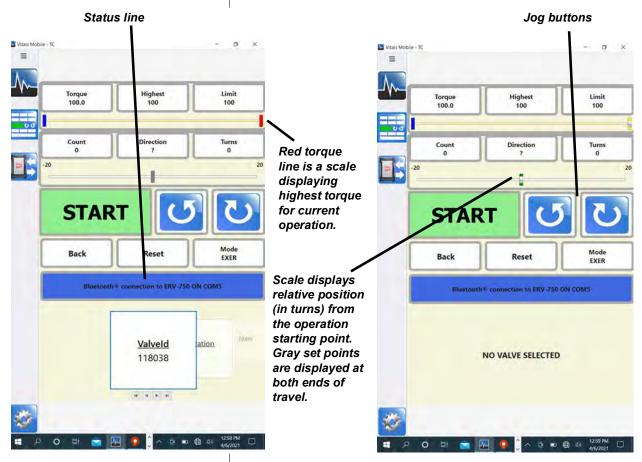


Figure 5-28. Controller screen with valve selected (left) and without valve (right).

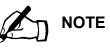
- **2.** The **Torque** field displays the current operating torque.
- **3.** The **Highest** field displays the highest torque level during the current operation.
- **4.** The Limit field displays the current torque limit. (To change the default torque limit setting, tap the Settings icon and go to the Controller Settings tab.)
- **5.** The **Count** field displays the current position, in number of turns from the starting point (positive or negative).
- 6. To override the automated exercising program and set a starting direction, tap the Direction button until either RH or LH appears. Leave the question mark in the display for automatic direction control.
- 7. The Turns field displays the total number of turns performed, in both directions, during the current operation.
- **8.** Press **START** to begin the valve operation. The valve exerciser will run in the selected mode. The button will turn red and the text will change to **STOP**.
- **9.** To turn the valve exerciser slightly in either direction (for positioning or installing the valve key), tap and hold on one of the **Jog** buttons. The operator will turn as long as you keep touching either of these buttons.
- **10.** By default, the valve exerciser mode is **EXER**, which runs the valve exercising protocol. You can also operate in Emergency Mode (**EMER**) and Manual Mode (**MAN**). Tap the **Mode** button to switch modes.
- **11.** Press **STOP** to end the valve operation. The button will blink white and green and the text will change to **START**.
- **12.** To reset the valve operation readings and the operating defaults, tap and hold the **Reset** button.
- **13.** Tap the **Back** button to go to the valve information screen for the current valve and enter remarks or other

If connection is not detected when the Vitals controller screen opens, a message will ask if you want to autoconnect. Tap **Yes**.

You can tap the **Tap to connect** button to try to make a connection to the valve operator using the saved port.



If you get a **Transducer Error** message during operation, there is something wrong with the transducers or cables. Operating with faulty transducer readings could cause valve damage. See "Transducer Errors" at the end of this section.



See Appendix A for a description of the operating modes.

information. You can also create a new valve record in the database.

- **14.** The status line shows details of the currently active connection or operation. You can tap the status line to toggle through current status messages, including operating values, connection messages, and exercising status messages.
- **15.** If the status line is a string of numbers, it is displaying the current connection type and machine selection.
 - turn count
 - transducer 1 value
 - transducer 2 value
 - machine ID
 - machine status.

Starting a New Activity with Existing Valve

Before starting new activities, perform a data transfer with Vitals Desktop to sync any changes from the Vitals database to the controller.

- **1.** Find the valve you want to operate by searching on the Home screen, using the Query and search functions.
- 2. Select the valve (or a related valve activity) in the results list.
- **3.** Tap the New Activity icon. Enter any information you want on the Valve screen, then tap the Save icon.
- **4.** Tap the Controller icon. The selected valve appears at the bottom of the screen. You can page through the valve data using the arrow buttons on-screen.



Figure 5-29. Start the valve activity for a selected valve.

5. Start the activity. See "Vitals Mobile Controller" on page 52.

Finding Valves on the Map

You can list valves that have GPS data by location, and show them using Maps. This allows you to find valves close to your current location.

- **1** Select the **All GPS Data** Query on the Home screen.
- **2.** Tap the **Dist. from** column header to sort the closest valves to the top of the list.
- **3.** Tap a valve record in the list to select it.
 - The Maps icon highlights to show GPS data is available.



Live Maps data are available only when the TC-100 is online (connected to wi-fi or a mobile hotspot). To use Maps without an internet connection, download your local map. Tap the Windows icon, go to Settings, then Apps>Offline Maps. Find your location and download the map.

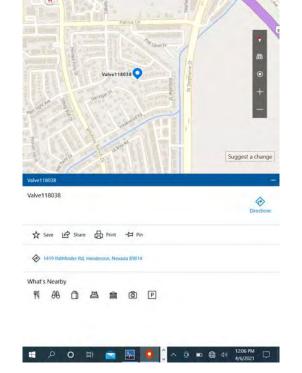


Figure 5-30.

4.

0

5. Use the Map controls to zoom the map view, and to show your location. Valves that are in the displayed map view will be shown on the map.

Tap the Maps icon. The Maps app opens, with the

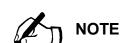
selected valve shown on the map.

Re Re

Starting a New Activity with a New Valve

Before starting new activities, perform a data transfer with Vitals Desktop to sync any changes from the Vitals database to the controller.

1 Tap the New Valve icon. The **New Valve** screen appears.



Maps is a separate app. You will have to return to Vitals Mobile-TC to continue.

Vitals Mobile - TC	*	- 0 ×	Tap the Cancel button to can- cel the New
●Valve (Ne	ew)		valve creation
Valveld			Tap in the fields
Location			to display the keyboard and
Notes			enter informa- tion
Size		*	
Depth		*	
EditDate	4/6/2021	1	
InstallDate	4/6/2021	22	
NormTurns			
CloseDir			
NormPosn		-	
● More Info			Tap the Save
		H	icon to save the valve

Figure 5-31. New valve screen.

- **2.** Enter a valve ID and as much information about the valve as you want. Tap the Save button.
- **3.** Tap the Controller icon. Perform the valve activity, then tap the **Back** button to save the activity information. See "Vitals Mobile Controller" on page 52.
- **4.** You can also start a New Valve activity by going to the Controller first. The Controller appears with **NO VALVE SELECTED** at the bottom of the screen.



Figure 5-32.

5. After the valve operation, tap the Back button to enter valve data. Tap the Save icon to save the information.

Transducer Errors

If you get a **Transducer Error** message while operating the TM-7 or ERV-750, the transducer readings from the valve operator are out of normal range. This indicates a problem with either the transducers or cables. **Caution: Vitals uses transducer readings to calculate operating torque. Operating with incorrect readings can cause the machine to break a valve.**

Contact E.H. Wachs for service if your valve operator is generating **Transducer Error** messages.

		DOP 0.9 Sats 9W
Torque lb.ft		Limit
150	150	150
INS	UFFICIENT	TRQ
Count	Direction	Turns
Critical M	lachine Fault	
	TRANSDUCER E	RROR
	TRANSDUCER EI VALVES MAY BR ADC1: 739. ADC Continue? Yes No	EAK
	VALVES MAY BR ADC1: 739. ADC Continue?	EAK

Figure 5-33. Example Transducer Error screen. If you tap Yes, the valve operation will continue. If you tap No, the valve operation will stop.



Figure 5-34. If you selected **Yes** to continue (left), the valve operation will continue. If you selected **No**, the valve operation is stopped. The message **TRANSDUCER ERROR** is noted on the screen.

Using the valve operator with transducer errors (by clicking **Yes**) is **not** recommended. If necessary, you can still operate it, but torque control will not be reliable. Use caution to avoid damaging the valve.

VITALS MOBILE DIAGNOSTICS

Use the Vitals Mobile Diagnostics program to identify problems with the valve operator or GPS function.

Vitals Diagnostics operates the valve operator; use the same safety precautions and procedures that you use when performing valve operations.

Do not use Vitals Diagnostics with the valve operator installed on a valve. Run Diagnostics only in the following circumstances:

- the valve operator is powered on and in operating position;
- the valve operator is **not** engaged with a valve;
- all safe operating procedures are in place. See the User Manual for your valve operator.

Before using the Diagnostics program, make sure you are familiar with the safety instructions for your valve operator. Refer to the valve operator user manual.

- **1** Tap the Settings icon on the Home screen to display the Settings screen.
- 2. Under the Connection tab, make sure the valve operator you are testing is active under MY CONNECTION.
- **3.** Tap the **Diagnostics** tab on the Settings screen. The Diagnostics **WARNING** screen appears.

Connection	1	GPS	D	ashboard
Diagnostics	s	Help		About
MACHINE WIL ATTACH TO AI INSTRUCTION	NY VALVE (IS IN PROD DO NOT	OR DEVICE.	Follow : Jal. /Alves.	
	ngre	e and contin		

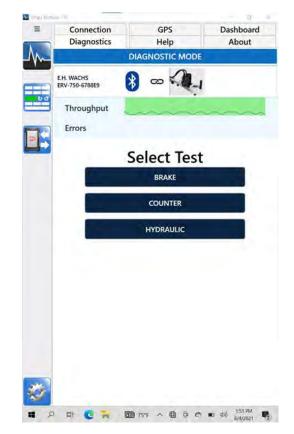
- **4.** Do not use diagnostics with the valve operator mounted on a valve. Tap **Agree and Continue**.
- **5.** The **SELECT TEST** screen appears.



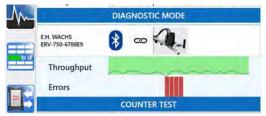
Vitals Diagnostics is designed to thoroughly check the data connection between the control board and the controller. Noise, incorrect data packets, etc. will prevent a connection.

To check for wiring/connector issues, use the Diagnostic Control Cable (for the TC-100, p/n 79-302-40). See "Using the Diagnostics Cable" on page 72.

(Vitals Mobile is not particular in establishing a machine connection. If Vitals Mobile connects, but Vitals Diagnostics does not, it indicates a connection issue.)



- The **BRAKE** test checks locking and releasing the valve operator brake.
- The **COUNTER** test checks the operation of the rotation counter.
- The **HYDRAULICS** test checks operation of the hydraulic system and the pressure transducers.
- **NOTE**: The **Errors** line below the **Throughput** graph displays the status of the data connection. Red bars in the graph indicate data connection failures.
 - An occasional red error bar is normal, but consistent or multiple error bars indicate a connection problem:



• Make sure you are using the controller close enough to the valve operator for a good Bluetooth connection, or connect the controller using the optional diagnostics cable.

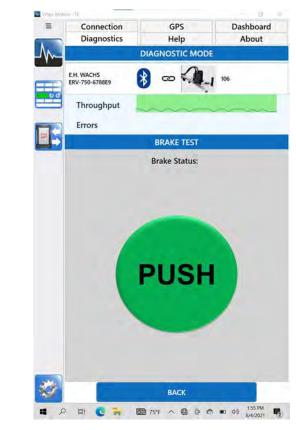
CO	nnection	GPS	1	Dashboard
Dia	agnostics	Help		About
		DIAGNOSTIC	MODE	
E.H. WAC		\$		
Thro	oughput			~~~
Erro	rs			
		Select	Test	

Figure 5-35. The red bars below the **Throughput** graph indicate data connection errors. If connecting with Bluetooth, try moving closer to the valve operator. You can also use the optional Diagnostics Cable.

- 6. Tap the button for the test you want to run. Refer to the following sections for instructions for each test.
- 7. After you have run the desired test(s), tap another Settings tab or program icon (Home, Controller, etc.) to continue.

Brake Test

1. When the brake test starts, the brake on the valve operator is locked. Tap and hold the green **PUSH** button.



2. The button turns yellow and the status changes to **RELEASED**. Take your finger off the button to lock the brake again.



3. To exit the brake test, tap the **Back** button.

Counter Test

1 The direction button reads either **RH** (right-hand) or **LH** (left-hand). Tap the direction button to change the test direction.

Diagnostics Help DIAGNOSTIC MOI EH. WACHS ERV-750-6788E9 & @ @ @ Throughput Errors COUNTER TEST 1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS S TURNS	About
COUNTER TEST 1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS	іЕ -1 -
ERV-750-6788E9 Throughput Errors COUNTER TEST 1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS 5 TURNS	4
Errors COUNTER TEST 1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS 5 TURNS	
COUNTER TEST 1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS S TURNS	
1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS 5 TURNS	
2. PRESS RUN 3. MACHINE TURNS 5 TURNS	
3. MACHINE TURNS 5 TURNS	
TURNS	
	(296)
RESULTS:	
STATUS:	
(D)-	
RH	RUN
Kn	KUN

2. Tap the RUN button to start the test. The test for the selected direction starts. The button changes to read **STOP**.

Connection	GPS	Dashboard
Diagnostics	Help	About
	DIAGNOSTIC MOD	E
E.H. WACHS ERV-750-6788E9		4
Throughput		~~~~~
Errors		
	COUNTER TEST	
1. M	ARK REF POINTS	
2. PI	RESS RUN	
3. M	ACHINE TURNS 5	(216)
TUR	NS	
RES	ULTS: 0 (0)	
STA	TUS: Turning RH	
	0	
	O -	
		STOP
		510P
	BACK	

- **3.** The status changes as the test is conducted. When the message at the bottom reads **Finished**, the test is complete.
- **4.** If you want to test in the opposite direction, tap the direction button (**RH/LH**) to change it and tap **RUN**.



5. To exit the counter test, tap the **Back** button.

Hydraulics Test

1. Tap to select the FLOW (MIN or MAX), PRESSURE (MIN or MAX), and DIRECTION (LH or RH).



When you start the Hydraulics Test, an error message appears if there is a transducer error. If you see this error message, follow the instructions in "Transducer Zero Torque Error" at the end of this section before performing the Hydraulics Test.

Connection	GP	S Da	shboard
Diagnostics	He	lp	About
	DIAGNOST	TIC MODE	
E.H. WACHS ERV-750-6788E9	∞ 🚯	106	
Throughput			
Errors			
	HYDRAUL	ICS TEST	
FLOW	V	PRESS	URE
MIN ●	MAX	MIN ●	MAX
	DIREC	TION	
		-	
BRAK		BRAK	- 2
OFF	ON	OFF	ON
	PRESSUR	E MAX	
	A: 104		
	B: 105		
	RESET	RUN	

2. Tap the **RUN** button to start the test. The test for the selected parameters begins, and the button changes to read **STOP**.

=	Connection	GPS		Dashboard
	Diagnostics	Help		About
\sim		DIAGNOSTIC	MODE	
	E.H. WACHS ERV-750-6788E9	8	106	
υσ	Throughput	~~~~	· · ·	~
1-1	Errors			
		HYDRAULIC	S TEST	
	FLOW		PRE	SSURE
	MIN	MAX	MIN	MAX
		DIRECTI	ON	
		HO OH	• RH	
		STOP		
	BRAKE	1	BRA	KE 2
	OFF	ON	OFF	ON
		PRESSURE	MAX	
		A: 104	104	
		B 105	105	
		0 105	105	
	RE	SET	STOP	
*		ВАСК		

- **3.** The status changes as the test is conducted. Press the **STOP** button to end the test.
- **4.** If desired, you can change the test parameters and run additional tests.
- **5.** To exit the hydraulics test, tap the **Back** button.

Transducer Zero Torque Error

A transducer error may cause a **Transducer Zero Torque** error message when you start the Hydraulics Test. To correct the error, adjust the transducer potentiometer in the valve operator control box.

1. Remove the 4 screws in the control box cover, and take off the cover to access the control board.



Do **NOT** run the Hydraulics Test while performing this adjustment. The valve operator must be in the stopped condition.

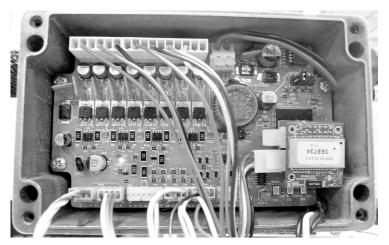
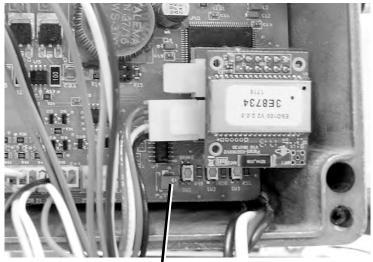


Figure 5-36. Open the control box to adjust the transducer potentiometer.

2. Locate the potentiometer on the control board. You will need a jeweler's screwdriver to adjust it.



Potentiometer adjustment screw

Figure 5-37. Locate the adjustment screw on the potentiometer.

Turn the adjustment screw on the potentiometer while watching the value for A on the Vitals Diagnostics Hydraulics Test screen. Adjust the A value until A and B are equal.

IMPORTANT: Do **NOT** run the Hydraulics Test while performing this adjustment. The valve operator must be in the stopped condition.



The actual values for **A** and **B** may vary, depending on whether hydraulic power is on. It doesn't matter what the values are when adjusting the potentiometer—only that you set them to be equal.

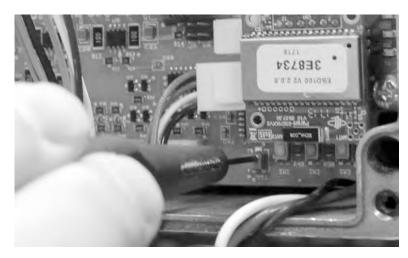


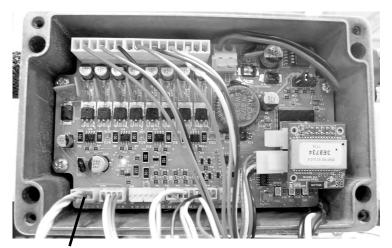
Figure 5-38. Turn the adjustment screw until the **A** *and* **B** *readings on the Hydraulics Test screen are equal.*

- **4.** When the **A** and **B** readings are equal, replace the cover on the control box.
- **5.** Continue with the Hydraulics Test by tapping the **RUN** button.

Using the Diagnostics Cable

To isolate possible wiring or connection issues, you can perform diagnostics using the optional Diagnostics Cable (part no. 79-302-40 for the TC-100).

- **1.** Connect the USB end of the diagnostics cable to the port on the TC-100.
- **2.** Remove the cover from the control box on the valve operator.
- **3.** Remove the internal cable connection from the bottom left of the circuit board, as shown in Figure 5-39.
- **4.** Plug the diagnostics cable into the circuit board where you removed the internal cable.



Remove the internal cable from the circuit board, and plug in the diagnostics cable

Figure 5-39. Plug the diagnostics cable directly into the circuit board in the valve operator control box.

- **5.** Perform the diagnostics as described earlier in this section.
- **6.** When finished, reconnect the internal cable and replace the control box cover.

Chapter 6 Using Vitals Mobile-HC (HC-100 Controller)

The HC-100 handheld controller runs the Vitals Mobile software. Vitals Mobile operates the valve exerciser and stores valve exercising data. You can transfer valve records from your PC running Vitals Desktop to the controller, or enter valve records using Vitals Mobile while in the field.

STARTING VITALS MOBILE

1. The Vitals Mobile icon appears on the HC-100 home screen. Tap the icon to start the program.

In This Chapter

STARTING VITALS MOBILE

PAIRING DEVICES USING BLUETOOTH

VITALS MOBILE CONTROLLER OPERATION

VITALS MOBILE DIAGNOSTICS



Figure 6-1. HC-100 home screen. Press the Home button on the keypad at any time to return to the home screen.

2. The Vitals Mobile main screen appears.

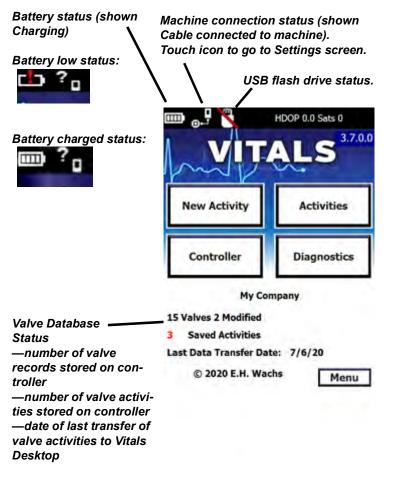


Figure 6-2. Vitals Mobile Main Screen

Main Screen Reference

- The New Activity button starts a new valve activity with data logging. Choose an existing valve ID, create a new one, or open the data entry screen. Search for nearby valves by pressing the GPS Search button.
- The Activities button opens the saved activities screen, containing a list of previously saved activities since the last Data Transfer.
- The **Controller** button opens the Vitals Controller program, enabling you to exercise a valve. Some activity information will be automatically entered, while most information will be left blank, giving you the option to enter data and save the activity after the exercise.
- The **Diagnostics** button opens the valve Diagnostics program, which helps identify valve operator problems.
- The Menu button displays the following commands.

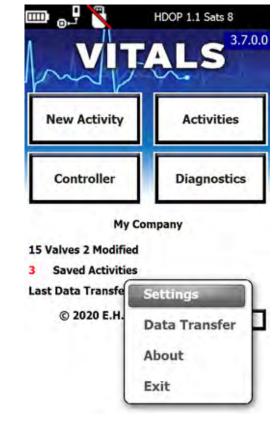


Figure 6-3. Vitals Mobile command menu.

- The **Settings** command opens the Vitals Mobile options screen. This screen contains settings for machine connection, GPS, and the default torque limit. (See "Changing Settings" below.)
- The **Data Transfer** command lets you transfer valve data to Vitals Desktop using a USB flash drive.
- The About command displays the Vitals Mobile About screen, with version information.
- The Exit command quits the Vitals Mobile program. To re-start the program, tap the Vitals Mobile icon on the HC-100 home screen.

bout	*	₩	0:29
V	itals Mobile™	3.7.0.0	
©20	20 E.H. Wachs	Company	
Show va	lves with no a	ctivities	
-			
	ок	Cancel	
-		_	
			ок)

Figure 6-4. The About screen displays version information.

Vitals Mobile™ 3.7.0.0		Ente	r Valve Id		GPS Se	earch
©2020 E.H. Wachs Company		2				
Show valves with no activities 3 4	1	2 23				1
		L				
		qw	e r t	y	u. i	0
ACHS		q w ≁l a	e r t s. d f	y	u i h j	o <u> </u>
ICHS			e. r t s. d f	y. g	u i h j	o k

Figure 6-5. Tap the Show valves with no activities checkbox to display a list of valve in the database that have no activity records. Tap the Valve ID you want. The Enter Valve ID screen appears with the valve selected; tap OK to continue.

Changing Controller Settings

You can select the valve operator controller, the GPS (embedded or external), and USB data connection.

1. Tap the **Controller Settings** icon at the top of the Vitals home screen.



Figure 6-6. Tap the **Controller Settings** *icon.*

2. The Controller Settings screen appears.

Г	Controller Settings	1
ľ	? ON I	
L		
	Connected On COM1	
	oller GPS	
T	Save Back	



3. Tap the **CONNECT** button to display the connections menu.

	HDOP 0.9 Sats 8
	Controller Settings Auto Detect Controller Cable Connection Joe's ERV
	Not Connected On COM1 Default Torque Limit 150 Controller GPS
	Save Back
	Figure 6-8. Connections menu.
4.	Use Auto Detect Controller to check all COM ports for a valid machine connection (either cable or Blue- tooth).
5.	To make a cable connection to a device, tap Cable Connection .
	• If there is no device connected, a Not Connected message will appear.

Rot Connected On COM1	
Not Connected On COM1	
Default Torque Limit	
a containe i condere annue	150 💌
ontroller GPS	
Save	Back

Figure 6-9. Controller Settings screen showing **Not Connected** *message.*

• If the cable is connected to a device, a **Connected** with... message will appear.

HDOP 1.0 Sets 7	HDOP 1.2 Sats 7
Controller Settings	Controller Settings
CONNECT	CONNECT
Connected with TM-7SD On COM1	Connected with ERV-750 On COM1
(Firmware 105)	(Firmware 105)
Default Torque Limit 150	Default Torque Limit 150
Controller GPS Back	Controller GPS Save Back

Figure 6-10. The images show the controller connected to the TM-7 (left) and ERV-750 (right).

6. To connect to a specific device, tap on its name in the menu (in this example, Joe's ERV).

1	Auto Detect Controller
.6	Cable Connection
	Joe's ERV
Firmw Defa	ted with TM-7SD On COM1 are 105) ult Torque Limit 150
	ler GPS
ontrol	
ontrol	Save Back

Figure 6-11.

• If the device is not connected, a **Not Connected...** message will appear.

	Cont	roller	Sett	ings
	?	CONNE	СТ	
L				
	onnected ault Torq	On COM5 Jue Limit	150	×
ontr	oller GPS	1		-
	Save		Ba	

Figure 6-12.

• If the device is connected, a **Connected with...** message will appear.

Controller Settings
K. 🛃 🚯 🔲
CONNECT
A Real Property of the State Street S
Connected with ERV-750 On COM5
(Firmware 105)
(Firmware 105) Default Torque Limit 150
(Firmware 105)
(Firmware 105) Default Torque Limit 150
(Firmware 105) Default Torque Limit 150 Controller GPS
(Firmware 105) Default Torque Limit 150 Controller GPS
(Firmware 105) Default Torque Limit 150 Controller GPS

7. Tap the **Save** button to save the settings. The **Save** button will gray out when settings are saved.

NOTE

To go back without saving settings, click **No**, then **Back**.

Г	Con	troll	er S	ettir	ngs
Ň	Cal	4	NNEC		
L			NNEC		2
	ected wi ware 10	th ERV-75 5)	50 On C	OM5	
Def	ault To	rque Lim	iit	150	
Contro	oller GP	s			
Г	Save	2	Г	Back	1
			-		_
L					

Figure 6-14. Tap Save to save settings, or Back to leave them unchanged.

- 8. To change default torque settings, tap the Default
 Torque Limit menu when connected to the valve operator.
- **9.** Tap the torque limit value you want, then tap Save.



Figure 6-15. Select the desired torque limit and then tap **Save**.

Changing GPS Settings

- **1.** To change GPS settings, tap GPS status at the top right of the Vitals screen.
 - If the internal GPS is connected, the **Connected Inter**nal GPS message appears.

×.	
co	NNECT
oppected	
Connected nternal GPS COM	M2 GlobalSAT
	An and the second states

Figure 6-16. Connected Internal GPS



HC-100 internal GPS: GPS COM Port: COM8 GPS Baud Rate: 115200.

• If the external GPS is connected, the **Connected External GPS** message appears.

m)? GF	*HDOP 2.8 Sats 5 S Settings
7	CONNECT
Connected	
GPS Search Ra	COM9 ProXT, 4641406181
Controller GPS	1.7 00
Apply	Back

Figure 6-17. Connected External GPS

2. Tap the CONNECT icon to select other GPS options.

)? <mark>0</mark>	Waiting for fix
٨	GPS S	Settings
	Auto Dete Internal G ProXT, 464	PS
	nnected ernal GPS COM	12 GlobalSAT
	S Search Radius	and an and a state of the state
Co	ntroller GPS	
	Apply	Back

Figure 6-18.

PAIRING DEVICES USING BLUETOOTH

ERV-750 or TM-7

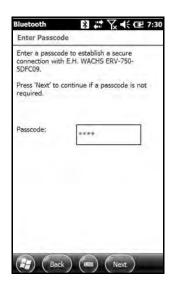
1. In the Home window, tap **Settings** and go to **Connections Bluetooth**. Tap **Add new device**...

Bluetooth		Yx ŧ€	(₽ 7:28	Bluetooth	图 # 7 1 1 1 7:29	Bluetooth	8 ₽ Yx 4€ Œ 7:29
COM Ports	Devices	>	Mode	Select a Bluet	ooth Device	Select a Blue	tooth Device
Tap Add new de Bluetooth device	es. Tap on a d		er	Searching for E	lluetooth Devices	Select a device Next.	to connect with and tap
modify its settin	gs,		_			🚷 E.H. WACI	HS ERV-750-5DFC09
Add new do	EVICE	-					
				1.11			
			_		Retrett.		Refresh
		Add) (ок)	(H) (Canc		(E) (Cano	

2. Tap the WACHS MACHINE device and tap Next.

Select a device Vext.	to connect with and	tap
🖇 E.H. WACI	HS ERV-750-SDFC09	
	C	
		Refresh

3. Tap the **Passcode** box and type "1234". Tap **Next**.



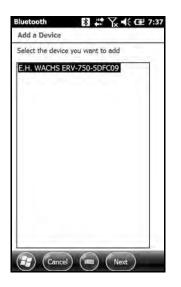
4. Tap **Done**.

Bluetooth	▶ ↓ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Enter Passcoo	le
	de to establish a secure E.H. WACHS ERV-750-
Press 'Next' to a required.	continue if a passcode is not
Passcode:	
Device Adde	i
	B phone has connected with RV-750-5DFC09,
() Done	Advanced

Tap WACHS MACHINE device again. 5. 谢 ₩ 🏹 代 🕑 7:35 Devic Tap Add new device to search for other Bluetooth devices. Tap on a device to modify its settings. Connected Add new device ... Disconnected E.H. WACHS ERV-750-5DFC09 ОК Check the Serial Port box and tap Save. (NOTE: You 6. can customize the Display Name. Be sure to include the string "ERV", "TM7", or "Wachs Machine" in the display name.) 8 . Yx € 1 7:36 Partnership Settings Display Name: E.H. WACHS ERV-750 Select services to use from this device. X Serial Port Refresh 🕂) (Cancel) (📼) Save Tap on the COM Ports tab and tap New Outgoing Port. 7.

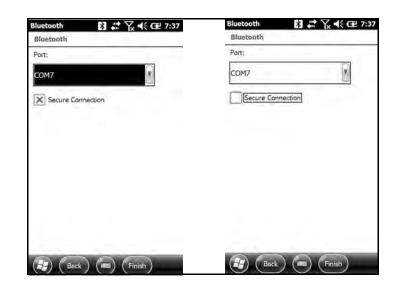


8. Tab the WACHS MACHINE device and tab Next.





If no COM ports are available, you may need to remove unused COM port assignments. See "No COM ports are available for Bluetooth pairing" in Chapter 7, "Troubleshooting Guide". Select the COM Port (any unused port except COM0 or COM8). Uncheck the Secure Connection box. Tap Finish.



Changing Bluetooth Device Names

If you change the name of a Bluetooth device, include the text "ERV", "TM", or "Wachs Machine" in the Display name. Vitals Mobile will only display devices with one of those text strings in the name. (This is to prevent connecting to any other, non-Wachs, Bluetooth devices.)

1 Tap the **Settings** button on the HC-100 home screen.



Figure 6-19. Tap the Settings button.

2. The **Settings** screen appears. Tap the **Connections** folder icon.



Figure 6-20.

3. The **Connections** screen appears. Tap the **Bluetooth** icon.



4. The **Bluetooth** screen appears, with a list of **Devices**. Tap the Device name you want to change.



Figure 6-22.

5. The **Partnership Settings** screen appears, with the current Device Name in the **Display Name** field.

Display Name:	E.H. WACHS ERV-750
Select services to	o use from this device.
X Serial Port	
2 ·	
	Refresh
Contraction of the second	

6. Type the new **Display Name**. Tap **Save** at the bottom of the screen.

	Joe's ERV
elect services to	use from this device.
🗙 Serial Port	

7. The new name now appears on the **Bluetooth** screen.



The Display Name must include one of the following text strings: "ERV", "TM7", or "Wachs Machine".

Figure

COM Ports Devices Mode Tap Add new device to search for other Bluetooth devices. Tap on a device to modify its settings. Connected Add new device Disconnected 3 Joe's ERV		@ ₽ Υ	~	
Bluetooth devices. Tap on a device to modify its settings. Connected Add new device Disconnected	COM Ports	Devices	>	Mode
Add new device Disconnected	Bluetooth device	s. Tap on a de		
Disconnected	Connected			
	Add new de	evice	-	
😺 Joe's ERV	Disconnected			
	3 Joe's ERV			
1				
	1			
	9			~

External GPS

1. In the Home window, turn Bluetooth ON by tapping the Bluetooth icon. (The icon is blue when Bluetooth is ON.) Tap **Settings**.



2. Go to Connections.



3. Go to Bluetooth and tap Add new device...



4. Click **Pro device** and tap **Next**.

Select a dev Next	nce to connect	with and tap	
WACHS	MACHINE-14	7FDC	٦
A OHOFON	1		
* Prote-12	1410-101	_	
	_	1	-
		Rel	asb.



E.H. Wachs' external Bluetooth GPS uses passcode 0000; other devices might have a different passcode. **5.** Tap the **Passcode** field and enter "0000". Tap **Next**.

	le to establish a secure Pro5421440495.
Press 'Next' to required.	continue il a passicode la rich
Passcode	***4

6. Tap Done.

inter a nemoula	e to establigh e secure
	Pre5421440496
frema Twent to co equired.	oronue if a prescode is no
Pessooder	
Device Addred	
Your Windows/8 Pro5421440496	phone has connected wi

7. Tap **Pro device** again.



8. You have the option to change the Display Name. Check the **Serial Port** box and tap **Save**.

ing linene-	Phy5421440496
of services to be	a fium tris denia.
5111-5	and the local division of the

9. Tap on the **COM Ports** tab and tap **New Outgoing Port**.





Select any unused COM port except **COM0** or **COM8**. Refer to *BlueTooth Pairing & Setup Instructions* (79-419-23). **10.** Tap the **Pro device** and tap **Next**.



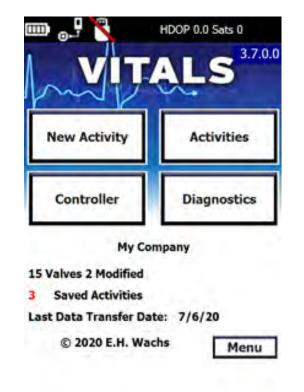
11. Select the COM Port. Uncheck the Secure Connection box. Tap Finish.



VITALS MOBILE CONTROLLER OPERATION

Vitals Controller

The Vitals Controller is the program for operating E.H. Wachs valve operators. If using a cable connection, make sure the control cable is connected to the serial port on the controller and to the port on the valve exerciser. If using a Bluetooth connection, make sure a Bluetooth module is properly installed on the machine's electronic board and that the Bluetooth settings on the controller device have been properly set up.



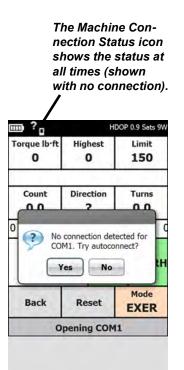
1 On the Vitals Mobile screen, tap the Controller button.

E.H. Wachs "No-Assumption" Valve Exercising

When you run the valve operator in EXER mode, it uses the "no-assumption" exercising protocol to determine direction of valve rotation.

Refer to Appendix A for a detailed description of the no-assumptions protocol.

If connection is not detected when the Vitals controller screen opens, a message will ask if you want to autoconnect. Tap **Yes**.



You can tap the **Tap to connect** button to try to make a connection to the valve operator using the saved COM port in the settings. **2.** The Vitals Controller screen appears.

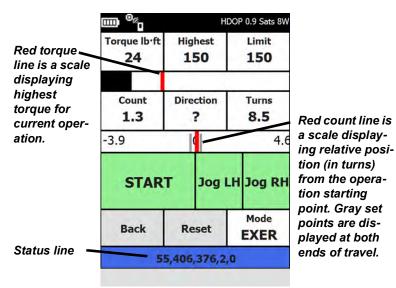


Figure 6-26. Vitals Controller

- **3.** The **Torque lb-ft** field displays the current operating torque.
- **4.** The **Highest** field displays the highest torque level during the current operation.
- 5. The Limit field displays the current torque limit. (To change the default torque limit setting, go Back to the main screen and tap the Settings button. Select a Default Torque Limit and tap the Apply button, then confirm the "Changing Settings" dialog.)
- 6. The **Count** field displays the current position, in number of turns from the starting point (positive or negative).
- To override the automated exercising program and set a starting direction, tap the Direction button until either RH or LH appears. Leave the question mark in the display for automatic direction control.
- **8.** The **Turns** field displays the total number of turns performed, in both directions, during the current operation.

- **9.** Press **START** to begin the valve operation. The valve exerciser will run in the selected mode. The button will turn red and the text will change to **STOP**.
- **10.** To turn the valve exerciser slightly in either direction (for positioning or installing the valve key), tap and hold on the **Jog LH** or **Jog RH** button. The operator will turn as long as you keep touching either of these buttons.
- **11.** By default, the valve exerciser mode is **EXER**, which runs the valve exercising protocol. You can also operate in Emergency Mode (**EMER**) and Manual Mode (**MAN**). Tap the **Mode** button to switch modes.
- **12.** Press **STOP** to end the valve operation. The button will blink white and green and the text will change to **START**.
- **13.** To reset the valve operation readings and the operating defaults, tap and hold the **Reset** button.
- **14.** The status line shows details of the currently active connection or operation. You can tap the status line to toggle through current status messages, including operating values, connection messages, and exercising status messages.
- **15.** If the status line is a string of numbers, it is displaying the current connection type and machine selection.
 - turn count
 - transducer 1 value
 - transducer 2 value
 - machine ID
 - machine status.



If you get a **Transducer Error** message during operation, there is something wrong with the transducers or cables. Operating with faulty transducer readings could cause valve damage. See "Transducer Errors" at the end of this section.



See Appendix A for a description of the operating modes.

		HD	OP 0.9 Sats 8W
Torque lb•ft 0	Hig	hest O	Limit 150
Count 0.0	Dire	ction ?	Turns 0.0
0	-		(
STAR	т	Jog L	H Jog RH
Back	Re	eset	Mode EXER
Ta	ap to	connec	t

16. To exit the Vitals Controller program, tap the **Back** button.

Transducer Errors

If you get a **Transducer Error** message while operating the TM-7 or ERV-750, the transducer readings from the valve operator are out of normal range. This indicates a problem with either the transducers or cables. **Caution: Vitals uses transducer readings to calculate operating torque. Operating with incorrect readings can cause the machine to break a valve.**

Contact E.H. Wachs for service if your valve operator is generating **Transducer Error** messages.

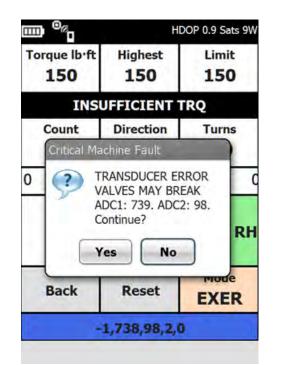


Figure 6-27. Example Transducer Error screen. If you tap Yes, the valve operation will continue. If you tap No, the valve operation will stop.

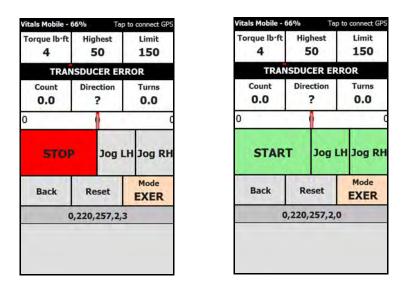


Figure 6-28. If you selected **Yes** to continue (left), the valve operation will continue. If you selected **No**, the valve operation is stopped. The message **TRANSDUCER ERROR** is noted on the screen.

Using the valve operator with transducer errors (by clicking **Yes**) is **not** recommended. If necessary, you can still operate



You can list valves that have no activities by displaying the **About** screen (**Menu->About**) and tapping the **Show valves with no activities** checkbox.

 About
 Image: Second secon

After you select a valve ID and click **OK**, the valve record will appear and you can begin the activity.

This feature is a shortcut to find valves that you have not exercised from the list downloaded to Vitals Mobile. it, but torque control will not be reliable. Use caution to avoid damaging the valve.

Valve Operation with Data Logging

Starting a New Valve Activity

Before starting new activities, perform a data transfer with Vitals Desktop to sync any changes from the Vitals database to the controller.

1. Tap the **New Activity** button on the Vitals Mobile screen.

	HDOP 1.2 Sats 7
New Activity	Activities
Controller	Diagnostics
My Con 15 Valves 2 Modified 3 Saved Activities Last Data Transfer Dat © 2020 E.H. Wad	

2. The Valve ID screen appears.

	7		HDOP 0	.9 Sats 8\
Ente	er Valve	Id	GPS Se	arch
1 1232 2 23 45	1			<
Calc	7	8	9	+ -
100 million (100 million)				1.1
-+	4	5	6	,
+	4	5	6	
→I ABC	4 1 !@#			t ø

3. Tap the **Tap to select Valve ID** button. The **Enter Valve ID** screen appears, with a keypad at the bottom.

			HDOP 0	.9 Sats 8W
Ente	er Valve	Id	GPS Se	earch
1233	3			
No r	ecords	found	d	
				-
Calc	7	8	9	+ -
Calc →I	7	8 5	9	+ -
Calc →	7 4 1	_		+ -
Calc →I I ABC		5	6	t

• Type in the ID of the valve you are exercising. Tap the **ABC** button to enter letters.

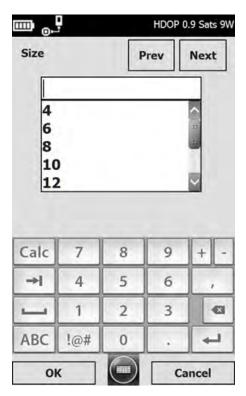


You can change the GPS search radius on the Settings screen. (See the "Changing Settings" section starting on page 80.)

- You can tap the **GPS Search** button to search the database for nearby valves (within a 50-foot radius). See "Using GPS Search" at the end of this section.
- **4.** If the ID of the valve is not in the database, the screen will display **No records found**. You can tap the **OK** button to create a new valve record with the ID you typed.

	HDOP	0.9 Sats 9
	1232	
VALVE INFO	111111111111	
Size Norm Posn Close Dir Condition Type Depth Street Cross Street Notes		
ACTIVITY INFO	111111111111	
Date Operated By	8/13/19	
(0	
Save	Controller	Menu

5. To enter data for any of the fields on the Valve Record screen, tap the field name. A data entry screen will appear.



- 6. Enter the data and tap the OK button to return to the Valve Record screen. To continue to the next or previous field, tap the Next or Prev button.
- 7. When you have the GPS receiver enabled, the GPS device will automatically log coordinates and the Latitude, Longitude, and GPS Positions fields will be added to the activity record. (These values are averaged over the duration of the activity to improve accuracy.)
- **8.** Tap **Controller** to enter the Vitals Controller screen. Tap **Menu** to view valve history specific to that valve, delete the valve activity, or open the options screen.
- **9.** After entering information for a new valve activity and tapping the **Controller** button, operate the valve exerciser as described in section "Vitals Controller Operation".
- **10.** After the activity is complete, click the **Back** button on the Vitals controller screen, then click **Save** to save the activity record data.

Vitals Mobile saves latitude and longitude data **only** to the activity record. It never changes these values in the valve record.

Using GPS Search

The GPS Search function allows you to find valves close to your current location. GPS Search uses valve location data from the valve record. If the valve record does not have location data, GPS Search uses data from activity records, if available.

1 Tap the **GPS Search** button on the **Enter Valve ID** screen.

Ente	r Valve	Id	GPS S	earch
1234	1			
No re	ecords	found	d	
Calc	7	8	9	+
Calc	_	8	9	+
Calc →I	7	8	9	+
Calc →I	_			+
Calc →I L	_	5	6	+

2. A list of valves within the search radius of your location appears. (The search radius appears at the top of the screen.)

∎ ₀	HDOP 0.9 Sats 9
Search Radius (ft) 50	Refresh
+ 6 - 2.2 feet	^
+ 1 - 2.9 feet	
+ 45 - 2.9 feet	
+ 54 - 3.0 feet	
+ 2 - 3.1 feet	
+ 5 - 4.1 feet	
+ 1 - 4.1 feet	
+ 1232 - 4.9 feet	
+ 12 - 4.9 feet	~
Current Lat. 42.1918	0933333
Current Lon87.938	97266667
ок	Cancel

- Search Radius (ft) is the currently set search radius. (You can change this on the Vitals Mobile Settings screen.)
- Current Lat. is the latitude of the controller
- Current Lon. is the longitude of the controller.
- Tap the **Refresh** button to refresh the valve list and location data. (Even if you don't move, the data may change because of variance in the GPS signal.)
- **3.** Tap a valve ID in the list to display its location information.

Search Radius	(ft) 50	Refresh
+ 1 - 4.1 fee	t	
+ 1232 - 4.9	feet	
+ 12 - 4.9 fe	et	
+ 5 - 5.0 fee	t	1
— 15 - 8.1 fe	et	
Bearing	g 322	
HDOP	0.9	
Latitud	e 42.19182	7
Longitu	ide -87.938	991
Current Lat.	42.19180	933333
Current Lon.	-87.9389	7266667

- **Bearing** is the degrees from north of the valve, relative to the position of the controller.
- HDOP (Horizontal Dilution of Precision) is a measure of the GPS signal quality. The smaller the value, the better the signal (less than 1.0 is desired).
- Latitude is the latitude for the valve stored in the valve record.
- **Longitude** is the longitude for the valve stored in the valve record.
- **4.** To start a new activity for a value in the list, tap the value ID to select it and tap the **OK** button. The **New Activity** screen appears with that value selected.

Accessing Saved Activities

1 To access previously saved activities, tap the **Activities** button on the Vitals Mobile main screen.

	HDOP 0.0 Sats 0
New Activity	Activities
Controller	Diagnostics
My Co	mpany
15 Valves 2 Modified	
3 Saved Activities	
Last Data Transfer Da	te: 7/6/20
© 2020 E.H. Wa	chs Menu

2. A screen appears with all of the activities that have been saved within Vitals Mobile since the last Data Transfer.

2, 8/26/19 5, 8/22/19 7, 8/21/19 5, 8/21/19 7, 8/21/19 5, 8/21/19 5, 8/21/19	Back	
5,8/22/19 7,8/21/19 9,8/21/19 7,8/21/19 5,8/21/19 5,8/21/19	45, 8/22/19 7, 8/21/19 3, 8/21/19 7, 8/21/19 5, 8/21/19 5, 8/21/19	
5,8/21/19 7,8/21/19 5,8/21/19	3, 8/21/19 7, 8/21/19 5, 8/21/19 5, 8/21/19	
, 8/21/19 , 8/21/19	7, 8/21/19 5, 8/21/19 5, 8/21/19	
	5, 8/21/19	
, 8/21/19	1	
Back Onen	Dack	0.000
Back		

3. To edit a saved activity, highlight the desired valve and tap the **Open** button. The valve record screen will appear.

⊡ ₀ .	HDOP 0.9 Sats 1	W0
	7	
Notes		1
ACTIVITY INFO		
Date	8/21/19	
Operated By	llu	
Turns	0.0	
Position		- 1
High Torque	150	
Begin Time	4:51 PM	
End Time	8:01 AM	
Remarks	PACK, PAVD, VA	С
Latitude	42.191818	
Longitude	-87.938994	
GPS Positions	36165	
TrqChart	005.trq	- 1
GPSFile	006.gps	
Back	Controller	Menu

- 4. To edit the activity information, tap a field and update the information, as described above in "Starting a New Valve Activity". To save the activity, tap the Save button. The Controller button is disabled to prevent overwriting a completed activity.
- **5.** If you tap **TrqChart**, the **TrqChart** screen appears. You can search for a torque chart for the selected valve ID, and display the chart.

		ats 8W
qChart	Prev	Next
005.trq		
Open 1	Forque Chart	
or	Ē	Cancel
ок		Cancel
	HDOP 1.0 Se 0 High Torque	ats 9W
	HDOP 1.0 S	ats 9W
ور عرض Turns = ا	HDOP 1.0 S	ats 9W
D ⊕+- H Turns = I	HDOP 1.0 S	ats 9W
⊒ _© [HDOP 1.0 S	ats 9W
D ⊕+- H Turns = I	HDOP 1.0 S	ats 9W
Turns = 1	HDOP 1.0 S	ats 9W = 150

6. Tap the OK button to exit the Saved Activities screen.

Enabling and Using GPS

GPS Status Bar Statements and Enabling GPS Receivers

You can automatically detect and log valve positions using the GPS receiver installed in the HC-100. Enable the GPS Vitals Mobile will only save 999 torque charts. If 999 torque charts are saved and you start a new activity, you will get a message saying that no torque chart will be saved. You can still perform the activity. To record more torque charts, download saved activities to Vitals Desktop.



HDOP is the Horizontal Dilution of Precision. The number immediately after HDOP provides an indication of the positional accuracy based on the current GPS signal and satellite positions. The smaller the number, the better the signal.

An HDOP of 1 is good. HDOP less than 1 indicates receiver is using SBAS to improve accuracy. receiver first. Refer to the following messages at the top of the Controller screen.

- **Tap to connect GPS** Indicates the GPS port is disconnected. Tap to enable GPS.
- **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 receiver is identifying GPS satellites from which to gather data 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.

Logging GPS Positions

You can increase GPS accuracy by logging positions over a period of time. To do this, tap the **Tap to connect GPS** command in the top right corner of the Vitals Mobile screen.

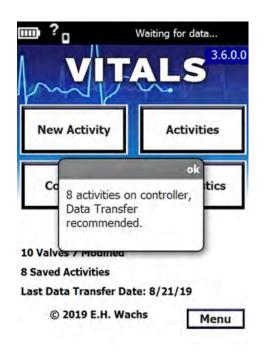
A "**connected**" GPS status message will appear, such as **HDOP 2.3 Sats 9W**, indicating that the GPS receiver is pulling coordinates.

To view the number of GPS readings and Latitude and Longitude coordinates, enter the valve record screen and scroll down to the **Latitude**, **Longitude**, and **GPS Positions** fields. The number of GPS positions increments with each GPS reading taken. The position is logged every 1.5 seconds.

Vitals Mobile Notifications

Notifications remind you to perform a data transfer when there are activities stored on the handheld controller. The notifications are triggered by number of activities and/or number of days since the last data transfer.

Pending notifications are displayed when Vitals Mobile starts up.



Tap **ok** to close the notification window. See "Transferring Data Between Vitals Desktop and Vitals Mobile" in Chapter 6 to transfer the activities.

You can edit the notification settings or turn this notification off within Vitals Desktop. See "Notifications" on page 190.

VITALS MOBILE DIAGNOSTICS

Use the Vitals Mobile Diagnostics program to identify problems with the valve operator or GPS function.

Vitals Diagnostics operates the valve operator; use the same safety precautions and procedures that you use when performing valve operations.

Do not use Vitals Diagnostics with the valve operator installed on a valve. Run Diagnostics only in the following circumstances:

- the valve operator is powered on and in operating position;
- the valve operator is **not** engaged with a valve;
- all safe operating procedures are in place. See the User Manual for your valve operator.

Before using the Diagnostics program, make sure you are familiar with the safety instructions for your valve operator. Refer to the valve operator user manual.

1. Tap the Diagnostics button on the Vitals Mobile main screen. The Diagnostics **WARNING** screen appears.

BOARD SN N/ MACHIN Connecte	'A E TYPE		1.0 RV-750	
	W	ARN	ING	
DIAGNO TO AN	OSTIC I Y VALV	Mode 'e or	DEVICE	ATE IN OT ATTACH E. FOLLOW N PRODUCT
I HA	VE READ	SAFE	TY INSTR	UCTIONS
	[0	K	
🔺 DO	NOT	OPER	RATE V	ALVES 🔺
ÅA	V	ΙΤΑ	LS™	A A

- **2.** Tap to select the I HAVE READ SAFETY INSTRUCTIONS checkbox, then tap OK.
- **3.** The **SELECT TEST** screen appears.

BOARD 1 SN N/A MACHINE T	03 VCD 1.0	, Eh
Connected		
100	SELECT TES	E
O BR	AKE	
O co	UNTER	
⊖ GP	S	
Ону	DRAULICS	
OK	Settings	Exit
	Securitys	LAIL

- The **BRAKE** test checks locking and releasing the valve operator brake.
- The **COUNTER** test checks the operation of the rotation counter.
- The GPS test checks the operation of the GPS unit.
- The **HYDRAULICS** test checks operation of the hydraulic system and the pressure transducers.
- **4.** Tap the checkbox for the test you want to run and tap **OK**.
- **5.** After you have run the desired test(s), return to the **SELECT TEST** screen and tap the **Exit** button to quit the Diagnostic program.

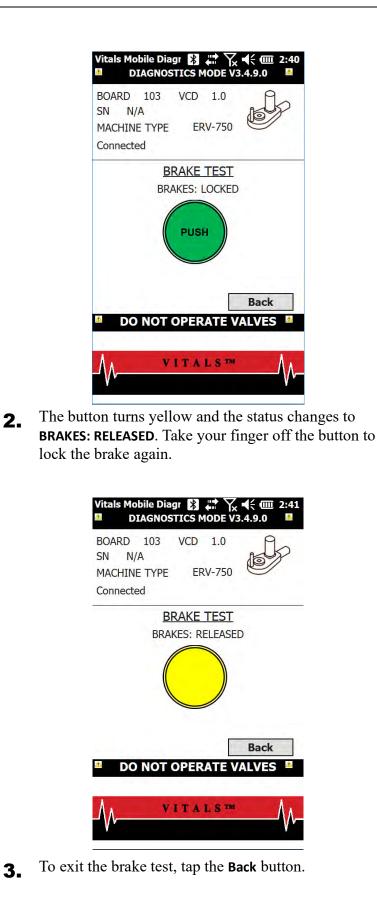
Brake Test

1. When the brake test starts, the brake on the valve operator is locked. Tap and hold the green **PUSH** button.

Vitals Diagnostics is designed to thoroughly check the data connection between the control board and the controller. Noise, incorrect data packets, etc. will prevent a connection.

To check for wiring/connector issues, use the Diagnostic Control Cable (for the HC-100, p/n 79-302-20).

(Vitals Mobile is not particular in establishing a machine connection. If Vitals Mobile connects, but Vitals Diagnostics does not, it indicates a connection issue.)



Counter Test

1. The direction button reads either **RH** (right-hand) or **LH** (left-hand). Tap the direction button to change the test direction.

Vitals Mobile Diagr 🔀 👫 🯹 ◀< আ 2:41 ■ DIAGNOSTICS MODE V3.4.9.0 🖪
BOARD 103 VCD 1.0 SN N/A
MACHINE TYPE ERV-750
Connected
COUNTER TEST
1. MARK REF POINTS 2. PRESS RUN 3. MACHINE TURNS 5(216)
Turns
RUN Back
DO NOT OPERATE VALVES
Å∧ VITALS™ Å∧
- V·

2. Tap the RUN button to start the test. The test for the selected direction starts. The button changes to read **STOP**.

Vitals Mobile Diagr 🛐 👯 🦕 🕂 2:42 ■ DIAGNOSTICS MODE V3.4.9.0 ■	
BOARD 103 VCD 1.0 SN N/A MACHINE TYPE ERV-750 Connected	
COUNTER TEST1. MARK REF POINTS2. PRESS RUN3. MACHINE TURNS 5(216)Turns0 (0)	
Turning RH STOP Back DO NOT OPERATE VALVES	
The status changes as the test is conducte message at the bottom reads Finished , the plete.	
If you want to test in the opposite direction direction button (RH/LH) to change it and	-
Vitals Mobile Diagr	
COUNTER TEST1. MARK REF POINTS2. PRESS RUN3. MACHINE TURNS 5(216)Turns0 (0)	
Finished RUN Back DO NOT OPERATE VALVES 10	
VITALS TM	

5. To exit the counter test, tap the **Back** button.

3.

4.

GPS Test

1. Tap the **START** button to start the test.

Vitals Mobile	Diagr 🚯 👯	Yx 4 € @ 2:43 E V3.4.9.0 [▲]
BOARD SN MACHINE TY	VCD	?
	d during GPS T	est
	GPS TEST	<u>[</u>
GPS Data . Latitude . Longitude . Quality .	42	Satellites . HDOP .
Start DO NO	Settings	Back
	VITALS	тм

2. The test begins and the button changes to read **STOP**. The status changes as the test is conducted.

	ile Diagr 👔 井 AGNOSTICS MODI		2:44 ▲
BOARD	VCD	う)
SN		· · · · ·	
MACHINE	TYPE	_	
Disconneo	ted during GPS T	est	
	GPS TEST	[
GPS Data	GPZDA,GPGGA,		
Latitude	4211.48334N	Satellites	0
Longitude	08756.92477W	HDOP	0
Quality	0 Fix not valid		
Only GGA	NMEA sentences	required.	
Stop	Settings	Back	(
			<u>^</u>
DO	NOT OPERATI	E VALVES	<u></u>
Δ.	VITALS	тм	A .
			′∖∖
			,

3. Press the **STOP** button to end the test.



When you start the Hydraulics Test, an error message appears if there is a transducer error. If you see this error message, follow the instructions in "Transducer Zero Torque Error" at the end of this section before performing the Hydraulics Test.

	obile Dia DIAGNO			4 € 000 4:24 3.4.9.0 ■	1
SN N	103 I/A NE TYPE		1.0 RV-750	D	
Connect	ted				
	HYD	RALI	CS TE	ST	
FLOW				ok ION	
() MIN					
<u> </u>		DUCER			
			DR. Plea		
BRAKE	manua		ng to us	10 C C C C	
OON	manua	l.		OFF	
PRESS				set	
A: 147	_	147		Reset	
B: 152		152			
RU	N			Back	
A D(NOT	OPER		ALVES 🔒	
			_		
Δ.	v	ITA	LSTM	Δ.	
-//					

4. To exit the GPS test, tap the **Back** button.

Hydraulics Test

1. Tap to select the FLOW (MIN or MAX), PRESSURE (MIN or MAX), and DIRECTION (LH or RH).

BOARD SN N/A MACHINE	4			<u>e</u>
Connecte	d			
	HYD	RAULI	CS TE	ST
FLOW	PRES	SURE	D	IRECTION
🔘 MIN	١	MIN		STOP
	O	MAX		
BRAKE 1	_		BRAK	E 2
	OFF			N 🔘 OFF
PRESSU	RE	MAX		Reset
A:				Rebet
B:				Back
RUN				
DO	NOT	OPER	AIEV	ALVES
			LS™	1

2. Tap the **RUN** button to start the test. The test for the selected parameters begins, and the button changes to read **STOP**.

Vitals Mobile	Diagr ∦ IOSTICS M		(÷ 000 2:46 4.9.0 ▲
BOARD 103	3 VCD	1.0	92
SN N/A			16Y
MACHINE TY	PE ER	V-750	\boldsymbol{e}
Connected			
H	(DRAULI	CS TES	Τ
FLOW P	RESSURE	DIR	ECTION
MIN (🔵 MIN	:	STOP
⊖ MAX (^{lh} O	
BRAKE 1		BRAKE	2
	OFF		OFF
PRESSURE A: 144	MAX 144		Reset
A: 144 B 137	144		
STOP	137		Back
DO NO	T OPER		LVES 🔺
Δλ	VITA		A
V			V V

- **3.** The status changes as the test is conducted. Press the **STOP** button to end the test.
- **4.** If desired, you can change the test parameters and run additional tests.

Vitals Mobile	e Diagr 👔 SNOSTICS M		
BOARD 10	03 VCD	1.0	. A
SN N/A MACHINE T	YPF ER	V-750	
Connected			
Ŀ	IYDRAULI	CS TES	Γ
_	PRESSURE	DIR	ECTION
		S	TOP
O MAX	MAX 🔘		
BRAKE 1		BRAKE 2	2
O ON (OFF		OFF
PRESSURE			Reset
A: 144 B 137	144 137		
STOP	1		Back
DO N	OT OPER		LVES 🔺
λ.	VITA	MT S TM	۸.
-\\∧	TIA		
v			ų

5. To exit the hydraulics test, tap the **Back** button.



Do **NOT** run the Hydraulics Test while performing this adjustment. The valve operator must be in the stopped condition.

Transducer Zero Torque Error

A transducer error may cause a **Transducer Zero Torque** error message when you start the Hydraulics Test. To correct the error, adjust the transducer potentiometer in the valve operator control box.

SN N	103 /A IE TYPE	VCD ER	1.0 V-750	E.
Connect	ed			
	HYDR		CS TE	
FLOW				ok ION
MIN	TRANSD	LICER	7FRO	P
	TORQUE			
BRAKE	adjust a			
OON	manual.			OFF
PRESS				
A: 147		147		Reset
B: 152		152		
RU	N			Back
_	D NOT (PFR		
		JYEK	AIE V	ALVES
DC				

1. Remove the 4 screws in the control box cover, and take off the cover to access the control board.

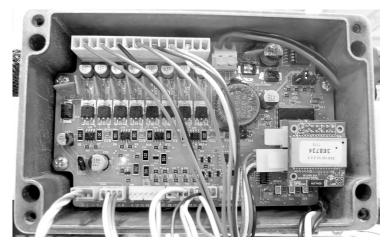
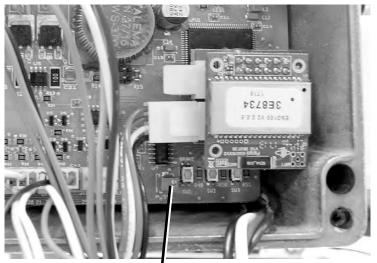


Figure 6-29. Open the control box to adjust the transducer potentiometer.

2. Locate the potentiometer on the control board. You will need a jeweler's screwdriver to adjust it.



Potentiometer adjustment screw

Figure 6-30. Locate the adjustment screw on the potentiometer.

Turn the adjustment screw on the potentiometer while watching the value for A on the Vitals Diagnostics Hydraulics Test screen. Adjust the A value until A and B are equal.

IMPORTANT: Do **NOT** run the Hydraulics Test while performing this adjustment. The valve operator must be in the stopped condition.

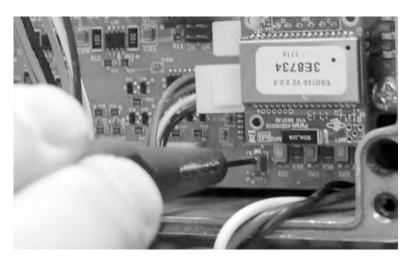


Figure 6-31. Turn the adjustment screw until the **A** *and* **B** *readings on the Hydraulics Test screen are equal.*



The actual values for **A** and **B** may vary, depending on whether hydraulic power is on. It doesn't matter what the values are when adjusting the potentiometer—only that you set them to be equal.

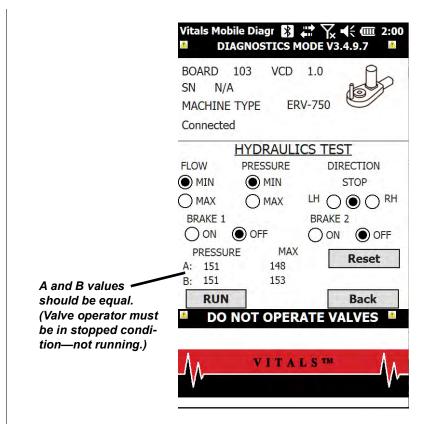


Figure 6-32. Adjust the potentiometer until the values for A and B are equal.

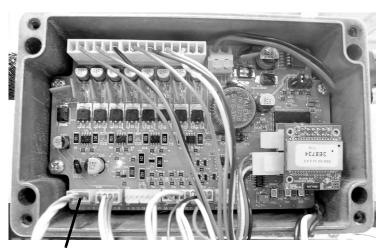
- **4.** When the **A** and **B** readings are equal, replace the cover on the control box.
- **5.** Continue with the Hydraulics Test by tapping the **RUN** button.

Using the Diagnostics Cable

To isolate possible wiring or connection issues, you can perform diagnostics using the optional Diagnostics Cable (part no. 79-302-20 for the HC-100).

- **1.** Connect the serial port end of the diagnostics cable to the port on the HC-100.
- **2.** Remove the cover from the control box on the valve operator.
- **3.** Remove the internal cable connection from the bottom left of the circuit board, as shown in Figure 6-33.

4. Plug the diagnostics cable into the circuit board where you removed the internal cable.



Remove the internal cable from the circuit board, and plug in the diagnostics cable

Figure 6-33. Plug the diagnostics cable directly into the circuit board in the valve operator control box.

- **5.** Perform the diagnostics as described earlier in this section.
- 6. When finished, reconnect the internal cable and replace the control box cover.

Diagnostics Logs

Vitals Mobile creates a log file any time Vitals Diagnostics is run, or any errors are detected while using Vitals Mobile. Error logs are transferred to the Vitals Desktop folder during a data transfer.

The log file is named **log.txt**. Log files are stored on the Vitals Desktop PC in the following location:

• C:\Program Files\Vitals Desktop\import

Email this log file to Tech Support when requested.

Chapter 7 Using Vitals Desktop

Vitals Desktop 3.8.1 provides a database for managing your valve records and tools for analyzing valve exercising data. You can create multiple database files, and can create valve records manually or import them from the Vitals Mobile device. Selected valve records can be exported to the controller to have it ready for valve operations in the field.

Vitals Desktop runs on a Windows-based PC. It is compatible with Windows 10, Windows 8, and Windows 7.

(Vitals Desktop 3.8.1 should be compatible with Windows XP. However, this has not been tested and is not supported. Compatibility is not guaranteed by E.H. Wachs.)

Instructions for installing Vitals Desktop are in Chapter 4.

INITIAL START-UP

When you start Vitals Desktop for the first time, you will be prompted to **Select a Default Language**.

In This Chapter

INITIAL START-UP

DATABASE FILE LOCATION

SCREEN REFERENCE

CREATING AND EDITING VALVES AND ACTIVITIES

ANALYZING VALVE DATA

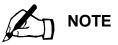
PRINTING

TRANSFERRING DATA BETWEEN VITALS DESKTOP AND VITALS MOBILE

DATABASE OPTIONS

SETTINGS

HELP OPTIONS



You will also be prompted to Select a Default Language if a default language file is not present.



Figure 7-1. Select Default Language

The language you select will be automatically set on the handheld controller when you set it up with Vitals Desktop.

When you install Vitals for the first time on a computer, you will be asked to create a new database or locate an existing database the first time you start the program. (See "Database File Location" below for creating or locating a Vitals database file.)

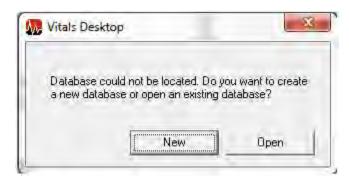


Figure 7-2. When you install Vitals for the first time and start the program, it will prompt you to create or find a database.

DATABASE FILE LOCATION

By default, Vitals Desktop creates its database file in the program's directory (**Program Files/Vitals Desktop/db/**). If the database is deleted, or moved to a different location,

Vitals Desktop will display the following dialog when launched.

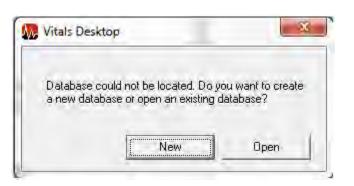


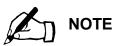
Figure 7-3. Vitals Desktop displays this notification if the database file is missing.

• To create a new database, click **New**. The Save As dialog appears. Name the database, select a location for it, and click **Save**.

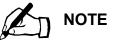
Libraries			
Documents			
Music.			
Fictures			
Videos			
File name:			
Save as type:	Vitals Database (".vcd;".mdb)		,
Hide Folders		Seve	Cancel

Figure 7-4. After clicking the **New** *button, name and save the new Vitals database.*

• To locate the existing database, click **Open**. The Open File dialog appears; browse to the location of the database file, click on the file to select it, and click **Open**.



The standard location for the Vitals database in the program's folder (**Program Files/ Vitals Desktop/db/**). However, you can save the file in any directory or on a network server.



To find a database file, you can search your computer drive for any file with a ".vcd" file extension.

rites Name	Date modified	Type	Size
sktop 🧧 test2.vcd	5/13/2015 1:57 PM	VCD File	376 KB
wnloac et test335.vcd	5/5/2015 3:47 PM	VCD File	352 KB
ries			
sic			
tures			
leos			
iputer -			_
File name: test2.vcd		+ Vitals	Database (*.vcd;*.me

Figure 7-5. After clicking the **Open** *button, browse to find the existing database, select the file, and click* **Open**.

SCREEN REFERENCE

This section describes the functions available on the Vitals Desktop 3.8.1 screens.

Main Screen

The Main Screen is displayed when Vitals Desktop 3.8.1 is first opened.

Vitals Desktop - E.H. Wachs	÷	×
New Valve		
Browse Valves		
Print Detail		
New Activity		
Browse Activities		
Activity Report		
Data Transfer		
Settings		
Help		
Exit		
Update		
E.H. Wachs 847-537-8800		

Figure 7-6. Vitals Desktop Main Screen

1	New Valve	Print	Sear	ch	Columns	3/293	Activitie	s Section	n	Valve Info		×
u Sectio	New Activity	ValveId		Size	NormPosn	Close Dir	Condition	Type 🔺	*	ValveId	V5588	*
	New Acuvicy	WD-WVAL-001667 WD-WVAL-001664		6	5 Open 5 Open	RH RH	Good Good	Gate Gate	E	Size	6	m
	Browse Valves			6							Open	
		V5588		6	Open	RH	Good	Gate		Close Dir	RH	
	Browse Activities	V5566		6	Open	RH	Good	Gate	Cond	Condition	Good	=
	Print Detail	V23		6	Open	RH	Good	Gate		Type	Gate	
		V0418		6	Open	RH	Good	1	Depth Street		6	
	Activity Report	vity Report V0415		10	Open	RH	Good	1		10.000		
		V0412		6	Open	RH	Good			Cross Street	Valve	Informat
	Data Transfer	TEST 2		232						Notes	2	Section
		SR4		0	Open	RH	Fair	Gate		Activities		-
	Database Setup	SR3		4	Open	RH	Fair	Gate		ValveId	Date Operated	dBy Tun
	Help	SR2		0			10.00				3/2008	20
	nep	SR1		4	Open	RH	Good	Gate				
	Exit	\$34802		0	1		1.1	225			Activity	Informa
		M1		12		RH	Good	Gate				Section
		L2			Open	RH	Good	Gate		* m		
		L1			Open	RH	Good	Gate		V558	8 1/8/2008	
	WACHS	HD 4803			Open	RH	Good	Gate		200		
	WAGIN	CHRIS HOW	ARD		Open Open	RH	Good	Gate				
		6263			Open	RH	Good	Butterfly		100		Sec. B.
	E.H. Wachs	0203		10	Open		GOOD	Butterny	٣	LBFT		ALC: NO.

Figure 7-7. Vitals Desktop Screen Sections

The Menu Section displays menu buttons for all application menu actions. • New Valve opens the New Valve window to create a valve record in the database. • Browse Valves lets you search for, review, and edit valve records. • Print Detail allows you to print the currently displayed data to the screen, a printer, or PDF. • New Activity opens the New Activity window, where you can manually enter data for a new activity. • Browse Activities lets you search for, review, and edit activity records. • Activity Report opens the Activity Report window, where you can search by date range. • Data Transfer starts a data transfer between Vitals Desktop and Vitals Mobile. You can transfer data by using a direct cable connection (to the HC-100, or older "Yellow Box" and "Silver Box" valve operator contollers); by using a USB flash drive; or by opening another database file on the Vitals Desktop computer. • Settings displays Settings menu commands. See "Settings" on page 188. • Help displays Help menu commands. See "Help Options" on page 190. • Exit quits the Vitals program. • Update checks your version of Vitals and lets you know if an updated version is available. The All Valves/Activities Section displays all valves or activities present in the currently open database, depending on whether you are browsing valves or activities. The Valve Information Section displays the valve records matching the current search/display criteria. The Activity Information Section displays the activity records matching the current search/display criteria. If you click on a valve record, the activities for that valve are displayed here. The Torque Chart Display shows the torque chart for the currently selected activity from the Activity Information section.

CREATING AND EDITING VALVES AND ACTIVITIES

If you need details about the structure of the Vitals valve database (for instance, for importing/exporting data to or from an external database), see Appendix B, "Vitals Database Reference".

How Vitals Uses GPS Location Information

Vitals 3.8.1 includes Latitude and Longitude in the valve record. You must enter these values to the valve record manually, using your best available GPS data for the valve. (You can also add them when importing valve data from an external database.)

The latitude and longitude stored in the **valve record** are considered the reference, or "correct", values. Vitals will look first to the valve record for GPS information about a valve (such as when doing a GPS search with Vitals Mobile). If there is no GPS information in the valve record, Vitals will use data from activity records for the valve.

Activity records have latitude and longitude values that are logged during the activity, using GPS measurements from the controller. These values may vary for a given valve, depending on the quality of the GPS readings during the activity, and may not be accurate. Note that Vitals Mobile only stores latitude and longitude data in activity records; it does not change the latitude and longitude in the valve record.

When Vitals needs location data for a valve that does not have latitude and longitude in the valve record, it reads from activity records for that valve and averages the available data.

Valve Record

Double click on any valve record in the Valves section to bring up the valve record window.

NOTE

Latitude and Longitude values are not required, but are recommended for GPS searches.

OK De	lete	
Valve Id	#1	
Size	8 🔹	
Norm Posm	Open 👻	
Close Dir	· · · · · ·	
Condition	Good	*
Type	Gate	•
Depth	4	
Street		
Cross Street	w 24 th street	
Notes	install 1969	-
Latitude		
Longitude		

Figure 7-8. Create/Edit Valve

- You can edit the information in the valve record, and click the **OK** button to save changes.
- Enter the Latitude and Longitude for the valve. The values in the valve record must be entered manually (or imported during a database import); use your most accurate GPS data for the valve.
- Click the **Delete** button to delete the valve record. You will be prompted to confirm that you want to delete it.
- You can also access this form and create a new valve record by clicking the **New Valve** button in the Menu Section on the left-hand side of Vitals Desktop.

Activity Record

Double click on any activity in the Activities section to display the activity record window.

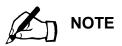
OK De	lete	
/alveId	3385	
Date	4/29/2009	
OperatedBy	cardona	
Turns	20.5	
osition	Open	
lighTorque	100	
leginTime	9:45 AM	
indTime	9:51 AM	
temarks		-
atitude	0	
ongitude	0	
ActivityId	194	
SPSPositions		
ransferId		

Figure 7-9. Create/Edit Activity

- You can edit the information in the activity record, and click the **OK** button to save changes.
- Click the **Delete** button to delete the activity record. You will be prompted to confirm that you want to delete it.
- You can also access this form and create a new activity record by clicking the **New Activity** button in the Menu Section on the left-hand side of Vitals Desktop. (When creating a new activity for a specified valve ID, a valve with that ID must exist in the database.)

Remarks List Window

The Select Remarks window displays the remarks you have defined and allows you to create new remarks.



When the user selects remarks on the handheld controller during an activity, the selected remarks are copied into the activity record.

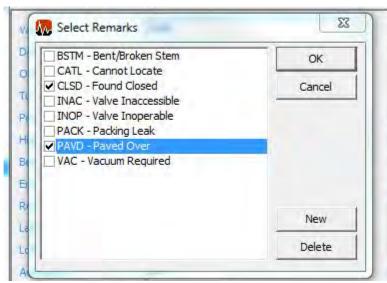


Figure 7-10. Select/Create Remarks

- The Select Remarks window is accessible by choosing the **Remarks** dropdown section in a New/Edit Activity window. (You can also access this window by clicking **Remarks List** in the Database Setup window.)
- Click **OK** or **Cancel** to close the Select Remarks window.
- Click **New** to enter a new remark.
- Click **Delete** to remove the highlighted remark from the list. You will be prompted to confirm that you want to delete the remark.
- The four-letter remark ID displays the ID of the remark. You cannot edit an existing remark ID.
- The remark description displays the description of the remark. The description can be up to 20 characters.

ANALYZING VALVE DATA

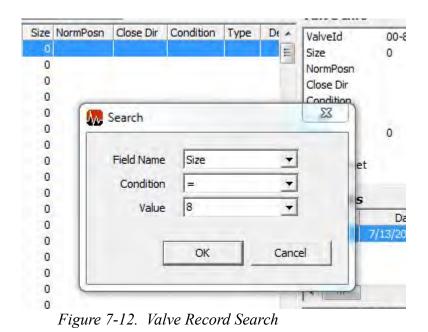
Displaying Valve/Activity Records

To display all the valve or activity records in the currently open database, click either the Browse Valves or Browse Activities button in the Menu Section on the left-hand side of Vitals Desktop.

	Print Sear	sh	Columns	3/293			Valve Info		>
New Activity	ValveId	Size	NormPosn	Close Dir	Condition	Type 🖌	ValveId	V5588	
NEW ACTIVITY	WD-WVAL-001667	6	Open	RH	Good	Gate =		6	Г
Browse Valves	WD-WVAL-001664	6	Open	RH	Good	Gate	NormPosn	Open	
	V5588	6	Open	RH	Good	Gate	Close Dir	RH	
Browse Activities	V5566	6	Open	RH	Good	Gate	Condition	Good	
	V23	6	Open	RH	Good	Gate	Type	Gate	
Print Detail	V0418	6	Open	RH	Good	1	Depth	6	
Activity Report	V0415	10	Open	RH	Good	1	Street		
Acavity Report	V0412	6	Open	RH	Good		Cross Street		
Data Transfer	TEST 2	232					Notes		
	SR4	0	Open	RH	Fair	Gate	Activities		
Database Setup	SR3	4	Open	RH	Fair	Gate		D 1 0 1 10	
	SR2	0					ValveId	Date OperatedBy	Т
Help	SR1	4	Open	RH	Good	Gate	V5588 1/8	/2008	
Exit	534802	0							
EXIL	M1	12	Open	RH	Good	Gate			
	L2	6	Open	RH	Good	Gate	* III		
-	L1	6	Open	RH	Good	Gate			_
IIII	HD 4803	6	Open	RH	Good	Gate	V5588	3 1/8/2008	_
WACHS	CHRIS HOWARD	8	Open	RH	Good	Gate	200		
1000	C1	4	Open	RH	Good	Gate	100		đ
E.H. Wachs	6263	16	Open	RH	Good	Butterfly .		underland an all of	1

Figure 7-11. Browse Valves

- To display the torque chart for an activity, click on the activity in the Activities section of the screen. The torque chart appears below.
- To view a larger version of a torque chart animation in its own window, double-click the torque chart graphic in the Torque Chart display section. To animate the torque chart, right-click the graphic and select **Animate**.
- 2. To search for valves/activities matching specific criteria, click the Search button in the All Valves/Activities section.



3. To select which fields appear on the valve/activity record screen, click the **Columns** button to bring up the Select Report Fields screen.

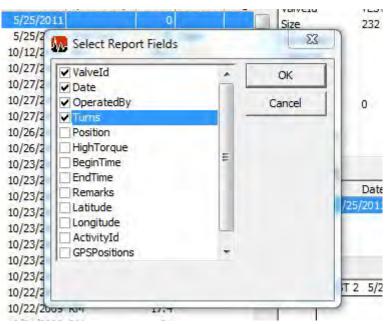


Figure 7-13. Select Report Fields

PRINTING

Print Detail

1 When you click **Print Detail**, the **Print Detail** dialog appears.

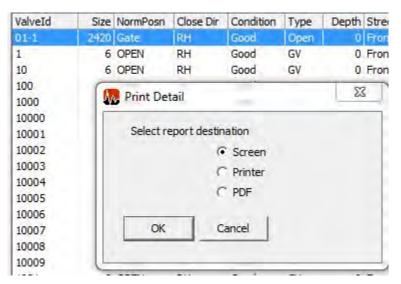


Figure 7-14. Print Detail

- Click a radio button titled **Screen**, **Printer**, or **PDF** to choose a location to print.
- Click **OK** to confirm printing.

VITALS[™] gg - Valve Detail Report

5/21/2015 Page 1 of 1

Valve#CAR111 Detail

ValveId	CAR111
Size	0
NormPosn	
Close Dir	
Condition	
Туре	
Depth	0
Street	
CrossStreet	
Notes	
Latitude	
Longitude	

Activity #1 of	3 Activities				
ValveId	Date	OperatedBy	Turns	Position	HighTorque
CAR111	4/20/2015		0		0
Begin Time	End Time	Remarks	Latitude	Longitude	ActivityId
8:48 AM	8:49 AM		42.425368	-88.632407	38
Activity #2 of	3 Activities				
ValveId	Date	OperatedBy	Turns	Position	HighTorque
CAR111	4/20/2015		0		0
Begin Time	End Time	Remarks	Latitude	Longitude	ActivityId
8:45 AM	8:48 AM		42.425354	-88.632419	37
Activity #3 of:	3 Activities				
ValveId	Date	OperatedBy	Turns	Position	HighTorque
CAR111	4/17/2015		0		0
Begin Time	End Time	Remarks	Latitude	Longitude	ActivityId
10:27 AM	10:27 AM		42.425376	-88.63241	29

Figure 7-15. Sample Print Detail

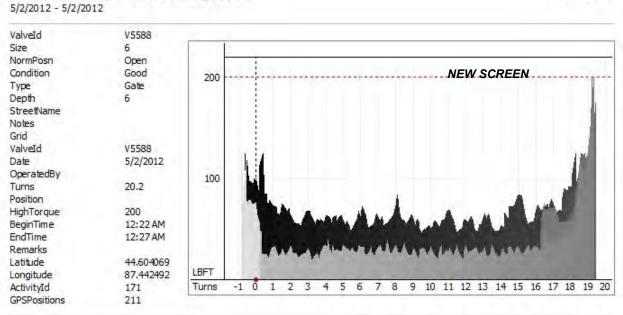
Activity Report

1. When you click **Activity Report**, the **Activity Report** dialog appears.

elect report da	ate range	
Start Date	10/13/2014	•
End Date	10/13/2014	-
	and the second s	
	Screen	

Figure 7-16. Activity Report

- Click the dropdown boxes next to Start Date and End ٠ Date to choose a date range of valves or activities for which you would like to produce a report.
- Click a radio button titled Screen, Printer, or PDF to • choose a location to print.
- Click OK to confirm printing. •



Sample Company - Valve Activity Report

Page 1 of 1

Figure 7-17. Sample Activity Report

TRANSFERRING DATA BETWEEN VITALS DESKTOP AND VITALS MOBILE

It is very important to understand where your master Vitals Desktop database is stored. It is highly recommended that the database reside on a network drive or other location accessible by all Vitals Desktop users. You should back up the Vitals Database periodically.

See the appropriate section below for:

- TC-100 Data Transfer
- HC-100 Data Transfer
- Other Controllers Data Transfer.

TC-100 Data Transfer

For the TC-100 controller, there are two data transfer methods:

- Flash Transfer—Uses a USB flash drive that you share between the devices. See "Database Options" on page 185.
- Local Transfer—If you have the optional TC-100 Office Dock and are running Vitals Desktop 3.8 on the TC-100, you can transfer data directly using Local Transfer.

You must be running Vitals Desktop version 3.8 (or later) to do data transfers with the TC-100. Update your Vitals Desktop version before transferring data.

TC-100 Flash Transfer

Use a USB flash drive to transfer data between Vitals Desktop and Vitals Mobile-TC. The flash transfer process will automatically synchronize all valve and activity data between Desktop and Mobile.

These are the steps of the transfer process:

- Plug a USB flash drive into the Vitals controller (TC-100 or HC-100), and transfer the data to the flash drive.
- Plug the flash drive into the Vitals Desktop computer and transfer the data into Vitals Desktop.
- Export the updated Vitals database back to the flash drive.
- Plug the flash drive back into the Vitals controller and transfer the data to Vitals Mobile.

NOTE: It is possible to transfer data from multiple controllers to a single flash drive before importing the records into the desktop database. However, you will have to perform the import process individually for each handheld transfer. (The transfers will appear as separate folders on the import screen, shown in Figure 7-24.)

1. Tap the Flash Transfer icon in the Vitals Mobile-TC menu. The **Flash Transfer** screen appears.



The USB flash drive must be formatted with the FAT32 file system. The drive must be compatible with the USB 1.1 standard. 8 GB capacity or less is recommended; larger drives take more time to load in the OS.

Not all USB flash drives are compatible with Windows Mobile 6.5. If the handheld controller won't read your USB flash drive, try another model with the correct specifications.



Figure 7-18. Tap the Flash Transfer icon to bring up the transfer screen.

2. Tap the version switch to set it for the version of Vitals Desktop you have on your database PC.

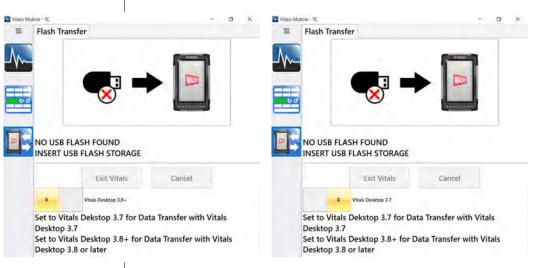


Figure 7-19. Select your Vitals Desktop version by tapping the version switch.

3. Insert a USB flash drive into the port on the bottom of the TC-100. The Start button appears on the screen.

Flash Tra	nsfer		
	010		
	STA		
	SH READY ART TO BEGIN FLASH	DATA TRANSFER	
D:\ is av	ailable		
	Exit Vitals	Cancel	
-	Vitals Desktop 3.8+		
Desktop Set to Vit	3.7	ta Transfer with Vitals Data Transfer with Vitals	

Figure 7-20. Tap Start when you see the USB Flash Ready message.

4. Tap the **Start** button. The screen will say **Copying**, then the **Files Copied** message appears.

itals Mobile - R		- 🗆 ×	Volativ N	tobile 🔳		- 0
Flash Tra	insfer	-		Flash Tra	nsfer	
	СОРУИ	NG	00			
COPYING PLEASE V		TC-100_38X5HQ2	Đ:	FILES COP	R ID : 20210406135623 PIED USB FLASH	3TC-100_38X5HQ2
D:\ is av	vailable			D:\ is av	ailable	
	Exit Vitals	Cancel			Exit Vitals	Cancel
-	Vitals Desktop 3.8+			-	Vitals Desktop 3.8+	
Desktop Set to Vit	als Dekstop 3.7 for Dat 3.7 als Desktop 3.8+ for D 3.8 or later			Desktop 3 Set to Vit		ta Transfer with Vitals ata Transfer with Vitals
2			*			

Figure 7-21. Data transfer in progress.

Remove the flash drive. A Pending Desktop Data Transfer message appears. (You will transfer the updated database back to the controller at the end of this procedure.)



Figure 7-22. Pending Desktop transfer status.

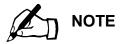
- **6.** Insert the flash drive into the Vitals Desktop computer.
- 7. Open Vitals Desktop and click the Data Transfer button. Select Flash Transfer from the Connect To drop-down menu. The screen will display a series of START messages.



-

Figure 7-23. Use the Flash Transfer connection.

8. Click on the folder name for the transfer. The folder name is the same as the **Transfer ID** shown on the Vitals Mobile screen.



If there are data transfers from multiple handheld controllers on the flash drive, they will appears as separate folders. You will need to import each folder individually. 🜆 Data Transfer

Connect To

Connect Using USB Flash Stick

lash Transfer

×

Close

ata Transfer			
Connect To	Flash Transfer	•	Start
Connect Using	USB Flash Stick	1	Close
Pick folder with	the same transfer ID as your mobile t	then dick "Start"	
D:\202008251	05550HC-100_154580		
			_
(
(
(

Figure 7-24. Select the name of the folder in the window. (Multiple folders will appear if there are transfers from multiple handheld controllers on the USB flash drive.)

9. Click the **Start** button. The **Updated Valves** import screen appears.

	New Activities			Update	ed Valves		1	_		_
Select valve rei the existing Val Updated/New 1	cords to be updated ves table. Press Re Values Table	by checking the I tesh button to relo Select All	ox. Difference ad valve list fro Unselect All	s between e on the contro	oisting valve oller	records are	highlighted in rec	1. New valves	will not hav	e a ValyelD in
Import N	/alveld Size	NormPosn 0 100 Glosed	CloseDir RH	Condition	Type Butterfly Şummer	Depth	Street D	ClossStreet	Notes	Laitude A
< Existing Valves	Table									×
Valveld 5 1 10 12 1-2 1-2 5	Size NomP 0	lasm CloseDie	Condition	Тире	Depth	Street 0	CrossStreet	Notes	Latitude	Longitud A
Retresh										
mport Summary	latabase:	CMan	g\CustomerSu 70 00 00	pport/new04	1232020 acc	db				

Figure 7-25. Updated Valves import screen.

- **10.** Click the **Import** button. The new valve data is imported from the flash drive.
- **11.** After the import is complete, export the database back to the flash drive. This ensures that all valve data on both Desktop and Mobile is synchronized.

Export Valve Records	×
Select valve records to export to	o Vitals Mobile.
 All valve records 	
C Specify valve recor	ds
Field	-
From	*
То	+
10.1	
15 valve records	OK Cancel

Figure 7-26. Export Valve Records screen.

12. A **Data has been exported** message will appear. Remove the flash drive from the Vitals Desktop computer. **13.** Insert the flash drive into the tablet controller. An **Updating Vitals Mobile Files** message appears.

Flash	Transfer				
	C	COPYIN		1	
PLEAS	SFER ID : 20210 FING Vitals Mol E WAIT			HQ2	
D:\ is	available				
	Exit V	/itals	Cancel		
-	Vitals Deskto	р 3.8+		_	
Deskto Set to	Vitals Dekstop op 3.7 Vitals Desktop op 3.8 or later				

Figure 7-27. A status message appears while data is transferred back to Vitals Mobile.

14. When the update is complete, a **Data Transfer Finished** message appears. Tap the **Exit Vitals** button.

IMPORTANT

You **must** complete the final step of re-inserting the USB flash drive into the handheld controller. This synchronizes all the activity records in the desktop and handheld databases.

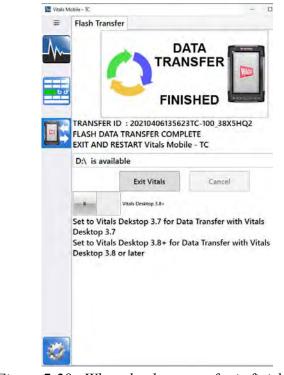


Figure 7-28. When the data transfer is finished, exit Vitals and restart.

15. Restart Vitals Mobile-TC.

TC-100 Local Transfer

You can perform a local transfer between Vitals Mobile-TC and Vitals Desktop if you have the optional TC-100 Office Dock and you are running Vitals Desktop on the TC-100.

(In this usage scenario, you are running Vitals Mobile-TC in the field for data logging, and running Vitals Desktop on the same TC-100 when in the office. To run Vitals Desktop on the TC-100, you must have it mounted in the Office Dock with external monitor, mouse, and keyboard, running it as a desktop PC.)

- **1.** Exit Vitals Mobile-TC on the TC-100.
- **2.** Mount the TC-100 in the Office Dock.
- **3.** Launch Vitals Desktop.
- **4.** Click **Data Transfer**. The Data Transfer screen appears. Click the **Connect to** menu and select **Local**.





5. With Local selected, click Start.

Connect To	Local	Ŧ	Start
Location	C:\VitalsMobile\		Close
	1		
67			- n -
The Hose of	Fare View	-	0
	Les Laterete ×	- A	Let Historial
14 10 H 3	i di Cat na Cat na (di Restrictione di Catalone Marine di Catalone di Catalon	Kerana Ner	Les Historiat
14 Ibut 3 A Date 230 A Anno date 230 An Atom Atom	a di Cat antroppica (Lationiti - X Matterita - X Matterita - X	Verane Nev. D. Meperte	L- Ested al Selectrone Los Sead
14 Ibut 3 A Date 230 A Anno date 230 An Atom Atom	antine contraction and contra	Kerane Ner Accente Verane Ner Accente Solder Spe	L- Ested al Selectrone Los Sead
Har Hover 24 ★ Hover 24 Hits Outre 2009 He attent Gross ← ↑ ↑ 24	A Color A Colo	Herane Nex Development en operation	Le History Construction n Send
Max Max	A CA Second Comparison Second	Krans Here Krans Here Kan Spa Market State Market State M	Le Historia Veletives Agileent station seat Age 14
100 Hours 20 → 100 Hours 2000 Hours 2000 access c → ↑ 2.4 → 100 Hours 2000 Coopy t → ↑ 2.4 → 100 Hours 2000 Coopy t → ↑ 2.4 → 100 Hours 2000 Coopy t → 100 Hours 2000 T	L Cot suffrequeres La Harriel - X suffrequeres La Harriel - X suffrequeres La Corpeter - so rese Cryster Do(C) > heathrobic > Data A biose getites	Kenning Health - Archest en Archest - Archest	Let H Storat Solar res Solar re
100 Hours 20 Anso Quere Looy Att activity Cooperation The Att Att Att Att Att Att Att Att Att At	A car auffragener	Ling and Lin	La Historia Construction e Sene Notestine Type A Notestine Type A Notestin
Nor Does 2 → 100 mm 2 → 100	Acta Active Contraction of the set of the se	Karan Y Her Control Vicenter V	Let Historia Control Libert Libert Libert Libert Type Historia Type Historia Type Historia Type Historia Type Historia Type Historia Type Historia His
12 Tour 2 The tour 2 The date 2 The dat	A Car Construction Constructio	Annual An	Le Historia Construction Le Construction Type Noticide Notici
A beau bit	A Construction of Construction Construction of Construction Construction of Construction Construc	Control	Lon Historia Characteristics Tyles transfer Tyles transfer Tyles transfer Tyles transfer Tyles transfer Tylestory
121 Date 2 Anto Astronomy Anto Anton Astronomy Anton Company Anton Type Company Anton Type Company Anton Type Company Anton An	A Construction Construction of the construction of the	Control - Contro	Lo Historia Chief Content Historia
10 II	A forme Cycles + tocale + Uds Tocale + Uds Cycles + tocale + Uds	A Control - A Cont	Lo- Historia 2 Weathing 6 Seat 100 100 100 100 100 100 100 10
100 100 200 1100 100 100 100 1100 100 100 100 1000 100 1000 1000 1000 1000 100 1000 100 1000 100 1000 1000 1000 1000 10000 1000 1000 10000 1000 1000 10000	A Construction Construction of the construction of the constructi	Control - Participanti - Participant	Lo Historia 2 Seature 2 Seature 4 Seature 6 Seature 70 Seature 100 Seature
10 II	A forme Cycles + tocale + Uds Tocale + Uds Cycles + tocale + Uds	A Control - A Cont	Lo- Historia 2 Weathing 6 Seat 100 100 100 100 100 100 100 10

Figure 7-30.

- **6.** If the **Database Mismatch** message appears, the database on Vitals Mobile-TC is different from the database currently open in Vitals Desktop.
- In general, click **Import Activities.** This imports activity data without changing the database structure.
- If the database in Vitals Desktop is blank or does not have any valves, you can click **Import Activities + All** valves. This will add all the valves from the controller to the local database.

Data loss might occur. Refer to "Database Mismatch" in Vitals Reference Manual Vitals Desktop: C:\Program Files\Vitals Desktop\db\new375.vcd UValves Vitals Mobile: S: Valves 0 Modified 2 Saved Activities Last Data Tranler Date:	Vitals De	sktop Databa	ase does not match Vitals Mobile	Database		
0 Valves Vitals Mobile: 6 Valves 0 Modilied 2 Saved Activities	Data loss	might occur	Refer to "Database Mismatch"	in Vitals Refer	ence Ma	inual
Vitals Mobile: 6 Valves 0 Modilied 2 Saved Activities	Vitals Desktop:	C:\Program Fil	es\Vitals Desktop\db\new375.vcd			
6 Valves 0 Modified 2 Saved Activities		0 Valves				
2 Saved Activilies	Vitels Mobile:					
		6 Valves 0 Mo	dilied			
Last Data Tranler Date:		2 Saved Activ	ties			
		Last Data Tra	iler Date:			
				1	-	
Import Activities Import Activities + All Valves Cancel	Impoit Act	ivities	Import Activities + All Valves	Canc	el	

Figure 7-31. Database Mismatch will appear only if the imported data does not match the Vitals Desktop database structure.

7. The **Updated Valves** tab on the **Data Import** screen allows you to review new or changed valve data from Vitals Mobile-TC.

Data Imp	ort										- 0	×
	New Act	ivities		1	1	Updat	ed Valves		7			
Select valv	e records to be Valves table. P	updaled inters Relation	by checka esh buttor	ig the l	box Dilleren ad valve list	ces between in from the contr	sisting valve oller	records are	highlighted in	red. New valves will not	have a Valvei	Din
Jpdated/N	lew Valves Tabl	e	Select All	1	Unselect	AR						
Import S S S S	Valveld rami/ralve rami/ralve2 Nemi/ralve3 Nemi/ralve3	Size	Non	Posn	CloseDir	Condition	Туре	Depth	Street	CrossStreet Notes	Latitud	• •
2	te											100
<												
xisting Va	lves Table											
										-	3	
Refree											3	
			Import		Cancel	J					,	
	ħ		Import	1_	Cancel					-	3	
Refres port Summ mpoding in Last Data 1	ħ	-	-	DVProy		kalk Desktople	₿\neHJ75 v	ed			3	

Figure 7-32.

8. The New Activities tab on the Data Import screen allows you to review new activity data from Vitals Mobile-TC.

Data Imp	non								-		×
-	New A	tivities		1	Upde	aled Valve:	1				
controller.		led to the data Selec	-	checking the b Unselect All		checked cannot be edited. P	ecs Reliesh	button to reloa	d new activity	lot from the	
New Activi	Valveld	Date	Deine	edBy Turnt	Position	HighTolque BeginTime	EndTime	Remarks	Latitude	Longitude	1
W W	deldd bbleb	4/7/2021	Im	eaby rum:	O	04:39 PM	10.43 AM	BSTM CATL	42.1953		ł
c Relies	ň										

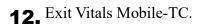


- **9.** When you have reviewed the data for import, click **Import** to continue.
- **10.** After the import is complete, export the database back to Vitals Mobile-TC. This ensures that all valve data on both Desktop and Mobile is synchronized.

5/25	Export Valve Records		>
Se	lect valve records to exp	ort to Vitals Mobile.	
	All valve record	ds	
	C Specify valve	records	
	Field		Ŧ
	From		
	то	~	
Figu	re 7-34.		
U		(ported messag	e will apr
U	re 7-34. Data has been ex	ported messag	e will app
1. The		(ported messag	e will app
1. The	Data has been ex	cported messag	e will app

Data Transfer			
Connect To	Local	•	Set
Location	C:\VitalsMobile\		Close
Data has been	exported. Data transfer is cor	mplete. Please restart	/itals Mobile - TC
<u></u>	1. A		- 11
Tel: How	Jan Dev		
A 12-1	P1 1.68	- 18 - 3	1 H: Siled al
1 12	Select A	Cuese 19. 🔄	- Distorture
1.	Select A	Entranie Niec - Accente	- Distorture
Anto Date (53) A Biteti	Support A	Ricaria Net Presente	A Butters
Avits (Aaste Long A astest Digt	ante el teste constante el teste el	Rerane Host	C Seat
entro charac (200) - A atomic (aufe Etaissonant Dunyte	Raranie New Poperte Solder Para Day	C Seat
ATTO CARE (20) ADDES (20) (Aller (Frain Account Cosyne	Renarit Hite Solder Year Spie V G Skates Scienco	T ₁ + HILTOLOG
Ans Gare (53) Note 01 (Antropycen Council A Antropycen Council Council 1990 - Postan Antropyce - Antropyce 1990 - Postan Antropyce - Antropyce Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antropyce - Antr	Ranani Hist Solder Sold	Tyle Filefolder
ATTO CARE (20) ADDES (20) (Constant Carte Constant	Remarks References Store	A Stantore A Stantore Sent Just Tyle Haztolda Telsfolda Telsfolda
Ans Gare (53) Note 01 (Controperation Contrope	Renarce Beer Day Sector	Annotation Annota
Ans State (SS) Note	Schreigtein Schreigte	The set of	Type Alternation Sense Type Alternation Type Alternation Type Alternation Type Alternation Type Alternation A
Ans State (SS) Note (C) (C) (C) (C) (C) (C) (C) (C) (C) (C)	Stroppen	terranti Terrat	Constant Constant Constant Constant Const
Arris (Aust 124) Matt Orr Control (Control (Contro) (Contro) (Contro) (Contro) (Cont	Constanting C	terrant New Angele New York Angele York An	The sent see of the set of the se
erspoker (30) bree 02 to the fill to the f	Company Contraction A Con	ternent terne bes- bes- bes- bes- bes- topological and topological and topological and topological and topological and topological and topological and topological and the cological and the cological and the cological and the cological and the	A Sources A Board State Tota Take Tak Take Taka Taka Taka Taka Taka Taka Taka Taka Taka Taka
Artspoker (200) Brote Oprime Traffic	Superior Control of Control	Recent Recent Access Ac	All been tained All been tained to tain
Artip Jack Course and	Company Contraction A Contraction A Contraction A Contraction A Contraction A Contraction A	ternet te	Autors taled Autors taled See Tale False
Artscher Gange Bioter Date Date Date Date Date Date Date Date	Constanting of the second	The second secon	All there is leader All there is leader file is a second file is a second
Artip Jack Course and	Company Contraction A Contraction A Contraction A Contraction A Contraction A Contraction A	ternet te	Autors taled Autors taled See Tale False





HC-100 Data Transfer

For the HC-100 controller, there are two data transfer methods:

- Flash Transfer—Uses a USB flash drive that you share between the devices. See "Database Options" on page 185.
- Vitals Mobile-HC—Uses Window Mobile Device Center to create a USB (direct cable) link between the two devices.

USB Flash Transfer with HC-100 Controller

Use a USB flash drive to transfer data between Vitals Desktop and Vitals Mobile-TC. The flash transfer process will automatically synchronize all valve and activity data between Desktop and Mobile.

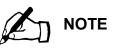
These are the steps of the transfer process:

- Plug a USB flash drive into the HC-100 controller and transfer the data to the flash drive.
- Plug the flash drive into the Vitals Desktop computer and transfer the data into Vitals Desktop.
- Export the updated Vitals database back to the flash drive.
- Plug the flash drive back into the HC-100 controller and transfer the data to Vitals Mobile-HC.

NOTE: It is possible to transfer data from multiple controllers to a single flash drive before importing the records into the desktop database. However, you will have to perform the import process individually for each handheld transfer. (The transfers will appear as separate folders on the import screen, shown in Figure 7-24.)

The following figures display the Data Transfer screens for the available connection types. Use the **Connect To** dropdown box to select the connection type.

• If connecting to a device running Vitals Mobile, connect the controller USB cable to the controller and to a USB port on your PC. In the **Connect To** dropdown box, select **Vitals Mobile**. The **Connect Using** dropdown box will



The USB flash drive must be formatted with the FAT32 file system. The drive must be compatible with the USB 1.1 standard. 8 GB capacity or less is recommended; larger drives take more time to load in the OS.

Not all USB flash drives are compatible with Windows Mobile 6.5. If the handheld controller won't read your USB flash drive, try another model with the correct specifications.



automatically select ActiveSync or Windows Mobile Device Center.

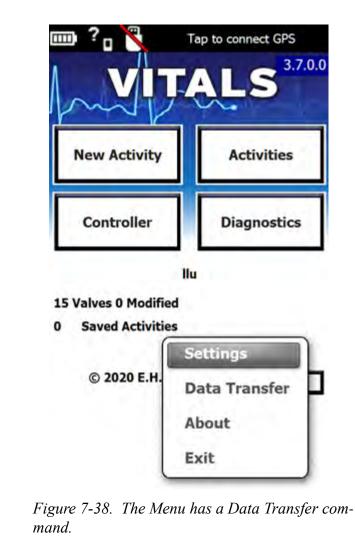
Figure 7-36. Data Transfer Start Screen for Vitals Mobile.

1. When you plug the flash drive into the controller, the USB flash drive status icon shows the drive is inserted.

	USB flash drive s	tatus icon	
	Tap to connect GPS		ALS ^{3.7.0.0}
New Activity	Activities	New Activity	Activities
Controller	Diagnostics	Controller	Diagnostics
	u		u
15 Valves 0 Modified		15 Valves 0 Modified	
0 Saved Activities		0 Saved Activities	
© 2020 E.H. Wa	chs Menu	© 2020 E.H. Wa	chs Menu

Figure 7-37. The USB flash drive status icon shows when a flash drive is inserted.

2. The Vitals Mobile Menu button has a Data Transfer command. You can open the Data Transfer feature by using the menu, or tapping the USB flash drive status icon when a flash drive is inserted.



3. If you try to start a data transfer with no flash drive inserted, an error screen appears.

Data Transfer	
→	
NO USB FLASH FOUND INSERT USB FLASH STORAGE	
Flash Transfer	
Exit Vitals Back	

Figure 7-39. Error message if no flash drive is inserted.

4. With the flash drive inserted, select **Data Transfer** to bring up the **Start** button.

	Data Transfer
	USB FLASH READY PRESS START TO BEGIN FLASH DATA TRANSFER
	Flash Transfer Exit Vitals Back
	Figure 7-40. The Start button appears when you sele
	Figure 7-40. The Start button appears when you sele the Data Transfer command.
-	<i>the</i> Data Transfer <i>command</i> . Tap Start to begin the transfer.
5 -	the Data Transfer command.
-	<i>the</i> Data Transfer <i>command</i>.Tap Start to begin the transfer.The transfer status is displayed, and a FILES COPIED
-	<i>the</i> Data Transfer <i>command</i>.Tap Start to begin the transfer.The transfer status is displayed, and a FILES COPIED
-	<i>the</i> Data Transfer <i>command</i>.Tap Start to begin the transfer.The transfer status is displayed, and a FILES COPIED
-	<i>the</i> Data Transfer <i>command</i>.Tap Start to begin the transfer.The transfer status is displayed, and a FILES COPIED
-	<i>the</i> Data Transfer <i>command</i>.Tap Start to begin the transfer.The transfer status is displayed, and a FILES COPIED
-	<i>the</i> Data Transfer <i>command</i>.Tap Start to begin the transfer.The transfer status is displayed, and a FILES COPIED



Figure 7-41. The data transfer status is displayed.

7. Remove the flash drive. A Pending Desktop Data Transfer message appears. (You will transfer the updated database back to the controller at the end of this procedure.)



Figure 7-42. Pending Desktop transfer status.



Insert the flash drive into the Vitals Desktop com-

Open Vitals Desktop and click the Data Transfer but-

ton. Select **Flash Transfer** from the **Connect To** dropdown menu. The screen will display a series of **START**

8.

9.

puter.

Figure 7-43. Use the Flash Transfer connection.

10. Click on the folder name for the transfer. The folder name is the same as the **Transfer ID** shown on the Vitals Mobile screen.



If there are data transfers from multiple handheld controllers on the flash drive, they will appears as separate folders. You will need to import each folder individually.

ata Transfer			
Connect To	Flash Transfer	•	Start
Connect Using	USB Flash Stick	1	Close
Pick folder with	the same transfer ID as your mobile t	then dick "Start"	
D:\202008251	05550HC-100_154580		
			_
(
(
(

Figure 7-44. Select the name of the folder in the window. (Multiple folders will appear if there are transfers from multiple handheld controllers on the USB flash drive.)

11. Click the **Start** button. The **Updated Valves** import screen appears.

	New Activities			Update	ed Valves		1	_		_
Select valve rei the existing Val Updated/New 1	cords to be updated ves table. Press Re Values Table	by checking the I tesh button to relo Select All	ox. Difference ad valve list fro Unselect All	s between e on the contro	oisting valve oller	records are	highlighted in rec	1. New valves	will not hav	e a ValyelD in
Import N	/alveld Size	NormPosn 0 100 Glosed	CloseDir RH	Condition	Type Butterfly Şummer	Depth	Street D	ClossStreet	Notes	Laitude A
< Existing Valves	Table									×
Valveld 5 1 10 12 1-2 1-2 5	Size NomP 0	lasm CloseDie	Condition	Тире	Depth	Street 0	CrossStreet	Notes	Latitude	Longitud A
Retresh										
mport Summary	latabase:	CMan	g\CustomerSu 70 00 00	pport/new04	1232020 acc	db				

Figure 7-45. Updated Valves import screen.

- **12.** Click the **Import** button. The new valve data is imported from the flash drive.
- **13.** After the import is complete, export the database back to the flash drive. This ensures that all valve data on both Desktop and Mobile is synchronized.

💹 Export Valve Records	×
Select valve records to export to Vitals	Mobile.
 All valve records 	
C Specify valve records	
Field	-
From	*
То	*
15 valve records OK	Cancel

Figure 7-46. Export Valve Records screen.

14. A **Data has been exported** message will appear. Remove the flash drive from the Vitals Desktop computer.





15. Insert the flash drive into the handheld controller. An **Updating Vitals Mobile Files** message appears.

IMPORTANT

You **must** complete the final step of re-inserting the USB flash drive into the handheld controller. This synchronizes all the activity records in the desktop and handheld databases.

Data Transfer
TRANSFER ID: 20200702121604HC-100_147865 UPDATING VITALS MOBILE FILES
PLEASE WAIT
Flash Transfer
Exit Vitals Cancel
Figure 7-48. A status message appears while data is transferred back to Vitals Mobile.
16. When the update is complete, a Data Transfer Finished message appears. Tap the Exit Vitals button.

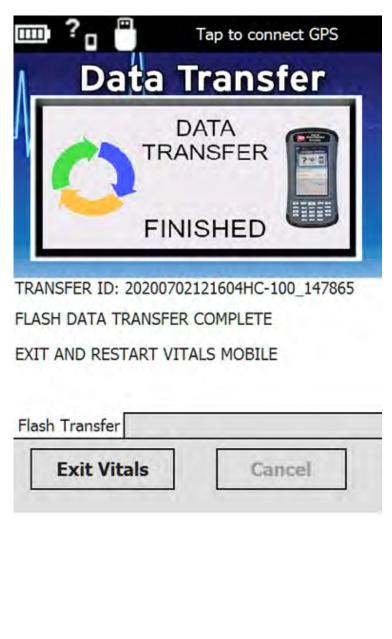


Figure 7-49. When the data transfer is finished, exit Vitals and restart.

17. Restart Vitals Mobile-HC.

Other Controllers Data Transfer

For P-2 or RS-2 machines using the Silver Box Controller/ Data Logger, or TM machines using TMC-DT1 Controller, there is one Data Transfer option for each. If connecting to a Silver Box controller, connect the Silver Box cable connection to the Silver Box controller and the RS232 connection to an RS232 port on your PC. In the Connect To dropdown box, select Controller/Data Logger. In the Connect Using dropdown box, select the COM port associated with your controller.



Figure 7-50. Data Transfer Start Screen for Silver Box Controller/Data Logger.

 If connecting to a Yellow Box controller, connect the Yellow Box cable connection to the Yellow Box controller and the RS232 connection to an RS232 port on your PC. In the Connect To dropdown box, select TMC-DT1 Controller. In the Connect Using dropdown box, select the COM port associated with your controller.

Data Transfer		
Connect To TMC-DT	1 Controller	Start
Connect Using COM1	•	Close
COM1 ready.		
	_	
START		
Viz Viz	S *	

Figure 7-51. Data Transfer Start Screen for Yellow TMC-DT1 Controller.

Data Transfer Review

When you transfer activities into the Vitals Desktop database, the **Data Import** screen displays the activity records.



If you are transferring data from a Yellow TMC-DT1 or Silver Box Controller, the Data Transfer Review and Database Mismatch steps are not applicable.

	New Ac	tivitiae	ľ ľ		Undai	ted Valves					
	nc w Au	JUTIUCS	L		opua						
	vities to be add	led to the data	base by check	king the bo	x. Valves not c	hecked cannot	be edited. P	ress Refresh I	button to relo	ad new activi	ty list from the
ontroller.											
ew Activi	ties Table										
mport	Valveld	Date	OperatedBy	Turns	Position	HighTorque	BeginTime	EndTime	Remarks	Latitude	Longitude
/	V1	7/18/2017					12:03 PM	12:04 PM			
/	V2	7/18/2017					12:04 PM	12:04 PM			
-	V3	7/18/2017					12:04 PM	12:04 PM			
/	V4	7/18/2017					12:04 PM	12:04 PM			
~	V5	7/18/2017					12:05 PM	12:05 PM			
✓	V6	7/18/2017					12:10 PM	12:10 PM			
							12.1011	12:10 PM			
< Refres	h						12.10111	12:10 PM	ļ		>
_	h							12:10 PM			>
Refres	nary										>
Refres port Summ	nary nto database:		C:\User:	s\akshays\	.Desktop\New	Database.vcd					>
Refres port Summ nporting in ast Data 1	nary nto database: Fransfer Date:		C:\User:	s\akshays\	Desktop\New	Database.vcd					>
Refres port Summ nporting in ast Data 1	nary nto database:	ated	C:\User:	s\akshays\	.Desktop\New	Database.vcd					>
Refres port Summ nporting in ast Data 1 New Valv	nary nto database: Fransfer Date:		C:\User:	s\akshays\	.Desktop\New	Database.vcd					>
Refres port Summ nporting in ast Data 1 New Valve Valve Re	nary nto database: Fransfer Date: ves will be crea	pdated	C:\User:	s\akshays\	.Desktop\New	Database.vcd					>

Figure 7-52. Data Import Screen

NOTE: If you get a **Database Mismatch** screen, refer to "Symptom: Database mismatch message after performing a Data Transfer." on page 204.

Datah e I			- 5 -			
Vitals De	sktop Datab	ase does not match Vitals Mobile	Database			
Data los:	s might occu	r. Refer to "Database Mismatch" i	n Vitals Reference Manua			
Vitals Desktop:	C:\Liang\Cus	tomerSupport\test.vcd				
	15 Valves					
Vitals Mobile:	C:\Liang\Cus	tomerSupport\new04232020.accdb				
	15 Valves 2 Modified					
	3 Saved Activ	vities				
	Last Data Tra	nfer Date: 7/6/20				
Import Act	tivities	Import Activities + All Valves	Cancel			

Figure 7-53. The Database Mismatch screen appears if there is a database error.

If there are activities you don't want to import, uncheck the box in the **Import** column.

You can edit details of the valve activities on the **New Activities** tab before completing the import. Click in the field you want to edit, and change the value or description. (You **cannot** change the Valve ID.)

	New Ac	tivities	1		Updai	ted Valves		1			
ielect acti			∟ base by check	ing the box		hecked cannot	be edited. Pi	ess Refresh I	button to relo	ad new activi	ty list from the
ontroller. Iew Activi	ties Table										
mport	Valveld	Date	OperatedBy	Turns	Position	HighTorque	BeginTime	EndTime	Remarks	Latitude	Longitude
~	VALVEO	7/18/2017		•	12		12:18 PM	12:19 PM			
 Image: A start of the start of	VALVE1	7/18/2017				50	12:19 PM	12:19 PM			
✓	VALVE2	7/18/2017					12:19 PM	12:19 PM			
~	VALVE3	7/18/2017					12:19 PM	12:20 PM			
✓	VALVE4	7/18/2017					12:20 PM	12:20 PM			
								12.201 M			
< Refres	sh [12.20T M			>
< Refre:	sh							12.201 M			>
								2.201 191			>
Refres port Sumn nporting ir	nary nto database:					Database.vcd		2.201 191			>
Refres port Summ nporting in ast Data	nary nto database: Transfer Date:			s\akshays\ 17 12:11:00				2.201 191			>
Refres port Summ nporting in ast Data New Val	nary nto database: Transfer Date: ves will be crea										>
Refres port Summ nporting in ast Data New Valve Valve Re	nary nto database: Transfer Date:	pdated									>

Figure 7-54. You can edit data on the Data Import screen, as shown in the Turns and HighTorque columns.

Click on the Updated Valves tab to review valve data that has been changed. Text in red indicates differences between data from Vitals Mobile and the data in the Vitals Desktop database. Valve records in red indicate new valves that are not in the database.

	New	Activities			Updated	Valves		1	_		
he existing	ve records to Valves tab	le Press Re	by checking the b tech button to relo	ox. Difference ad valve list fro Unselect All	s between existen the controls	ting valve H.	records are	highlighted in red	L New valves	will not hav	e a ValveiD in
Import	Valveld		NomPosti D	CloseDir 1H 1H		Type Butterlij	Depth	Street. 0.	Cross5treet	Notes	Latitude
¢	lves Table										
Valvelid 1-2	Sce 1 10 12 23	NomP 0	Unit CloseDa	Condition	Type / Butterfly	Deptin	'Steet	(CrootSteel	Notes	Linlude	Longilud A
ast Data New Val Valve Re	nary nto database Transiter Dat ves will be c econds will be mities will be	te realed s updated	Cillion	g\CustamerSu	ppo#\fell.vcd	4					

Figure 7-55. New valve data appears in red text on the **Updated Valves** *tab of the* **Data Import** *screen.*

You can edit details of the valve data on the **Updated Valves** tab before completing the import.

Valves records to be updated by checking the box. Differences between existing valve records are highlighted in red. New valves will not have a ValveID in he existing Valves Table Import Valves Table Import ValveId Size NormPosn CloseDir Condition Type Depth Street CrossStreet Notes Latitude Import V1 12 Open RH Fair Gate Import ValveId CrossStreet Notes Latitude Import V2 4 Closed LH Good Gate Import V4 20 Import V4 Import V5 16 Open Good Import Valves Table Import Valves Table Import V4 V4 V5 16 Open Good Import		New A	ctivities		[Update	ed Valves						
V1 12 Open RH Fair Fair<	ne existing	Valves table.	Press Refresh	hecking the l button to rela	oox. Differen ad valve list	ces between e from the contro	xisting valve oller.	e records are H	nighlighted in i	red. New valves	will not hav	ve a ValvelD	in
V2 4 Closed LH Good Gate V3 14 Good Gate Gate </th <th>mport</th> <th>Valveld</th> <th>Size</th> <th>NormPosn</th> <th>CloseDir</th> <th>Condition</th> <th>Туре</th> <th>Depth</th> <th>Street</th> <th>CrossStreet</th> <th>Notes</th> <th>Latitude</th> <th>^</th>	mport	Valveld	Size	NormPosn	CloseDir	Condition	Туре	Depth	Street	CrossStreet	Notes	Latitude	^
V3 14 V4 20 V5 16 Open Good	•	V1	1.	2 Open	BH	Fair							
V4 20 V5 16 Open Good V xisting Valves Table					LH	Good	Gate						
V5 16 Open Good V xisting Valves Table													
< xisting Valves Table													
xisting Valves Table			1	o Upen		Good	_						Υ.
	<												
	xisting Va	lves Table									Ì	,	
	Refres port Summ	h hary ito database:		C:\Use	rs\akshays\[) Desktop\New[Database.vo	d					
	Refres port Summ mporting in ast Data 1	h iary ito database: fransfer Date:		C:\Use	rs\akshays\[Desktop\New[Database.vc	d					
New Valves will be created	Refres port Summ mporting in ast Data 1 i New Valv	h iary ito database: Fransfer Date: ves will be crea		C:\Use	rs\akshays\[Desktop\New[Database.vc	d					
ast Data Transfer Date: ; New Valves will be created ; Valve Records will be updated ; New Activities will be created	Refres port Summ mporting in ast Data 1 : New Valve I Valve Re	h iary ito database: fransfer Date: ves will be crea cords will be u	pdated	C:\Use	rs\akshays\[)esktop\New[)atabase.vc	d					

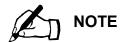
Figure 7-56. Data that you have added or edited appears in black text on the **Updated Valves** *tab.*

Any additions or changes will be saved to the Vitals database. The Import Summary highlights the changes. After you have reviewed the activity and valve data, click the Import button to import it. All valves are displayed.

Uploading Large Databases

On the HC-100 controller, responsiveness diminishes as the valve database size grows. Uploading data sets with more than 50,000 valves creates a slight lag.

If your database is over 50,000 valve records, a message will appear recommending you to select a range to upload. (You may still upload your entire database if you wish)



Slow performance may also occur on the TC-100 controller in Legacy mode.

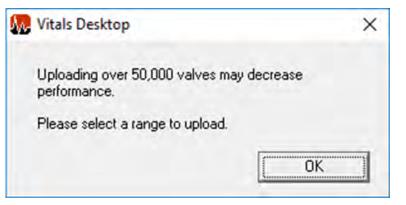


Figure 7-57. Over 50,000 Valve Record Message

To split your database into smaller sections for upload, perform the following steps.

- **1.** Create a new field in your Valves table to identify distinct sections of your valve record structure, such as Grid. In this example, different Grid choices could be A, B, C, etc. Refer to "Customize Data Fields" in the "Database Options" section for more information on creating custom data fields.
- 2. Add the appropriate Grid choice for each valve record by editing the valve record information. Refer to "Valve Record" in the "Creating and Editing Valves and Activities" section for more information on editing valve records.
- **3.** Start a Data Transfer and select **OK** when the range selection message appears. The Export Valve Records screen appears.

elect valve records to expor	t to Vitals Mobile.
 All valve records 	6
C Specify valve rea	cords
Field	*
From	*
То	
7357 valve records	OK Cancel

Figure 7-58. Select Valves to Export

4. Click the radio button **Specify valve records**. Select **Grid** in the **Field** dropdown and choose the grid(s) containing the valves you wish to upload. Notice that the number of valve records being transferred has been reduced to only those that meet the specified requirements.

Select valve records to e	xport to Vitals Mobile.	
C All valve rec	ords	
Specify valv	e records	
Field	Grid	•
From	A 💌	
То	C 🔹	
35 valve records	ок	Cancel

Figure 7-59. Specify Valve Records - Custom Field Specification

5. Complete the remainder of the Data Transfer.

DATABASE OPTIONS

Database Setup

This section describes the actions you can perform with the currently open database. Click the **Settings** button and select the **Database Setup** command to see the database options.

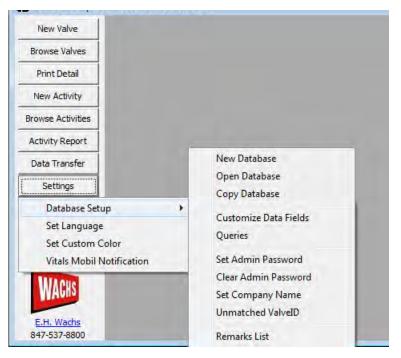


Figure 7-60. Database Setup Options

- New Database allows you to create a new blank database.
- **Open Database** allows you to open an existing database.
- **Copy Database** allows you to create a copy of an existing database.
- **Customize Data Fields** displays the Customize Data Fields screen, which allows you to create custom fields to your database for valves and activities. See section "Customize Data Fields" for more information.
- **Queries** displays the Query List screen, which allows you to create and run SQL queries against the currently open database. See section "Queries" for more information.
- Set Admin Password allows you to create a password to limit access to the Database Setup options.

- **Clear Admin Password** lets you remove password protection from the database. It will prompt you for the password when changing this setting.
- Set Company Name allows you to create or edit a company name associated with the currently open database.
- Unmatched Valveld allows you to find activities from the Activities table that do not have an associated valve with the same Valveld in the Valves table. This option will allow you to create valves with Valvelds in the Valves table to ensure that all activities in the Activities table are associated with a valve in the Valves table.
- **Remarks List** displays the remarks you have defined and allows you to create new remarks. See section "Remarks List Window" for more information.

Customize Data Fields

This section describes the Customize Data Fields screen and how to create custom data fields.

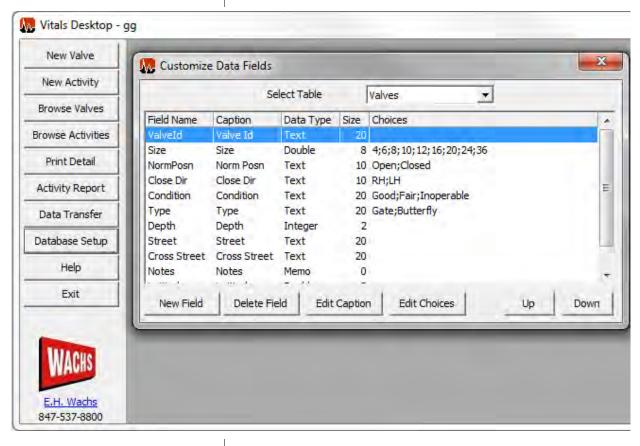


Figure 7-61. Customize Data Fields

- In the Select Table dropdown box, you can select whether you would like to add a data field to the Valves or Activities table.
- Field Name displays the name given to each data field, which is seen by the database.
- **Caption** displays the familiar name of each data field, which is seen by the user in Vitals Desktop and Vitals Mobile.
- **Data Type** displays the type of data that can be entered into each field.
- Size displays the maximum length each choice of a field.
- **Choices** displays the default options available for each field.
- Click **Delete Field** to delete a preexisting field. You will not be able to the delete a field if there is information associated with a valve pertaining to that field.
- Click the **New Field** button to create a new custom data field. This will bring up the New Field screen. Here, you will be able to specify a Field Name and Data Type.
- Click the **Edit Caption** button to edit the caption associated with the highlighted data field.
- Click the **Edit Choices** button to edit the choices associated with the highlighted data field.
- Click the **Up** or **Down** arrows to choose the order in which the data fields are displayed when analyzing valve information.

Queries

This section describes the Queries screen and how to create, edit, run, and delete queries. All queries are written in SQL (Structured Query Language).

The Query List screen shows a list of created queries.

AvgLatLon	Run
	Cancel
	Edit
	Delete
	New

Figure 7-62. Query List

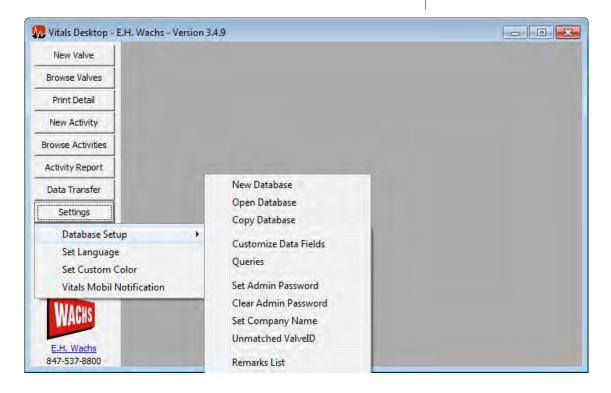
- Click the **Run** button to perform the highlighted query statement. This will return the valve or activity information specified in the query.
- Click the **Edit** button to edit the highlighted query.
- Click the **Delete** button to delete the highlighted query.
- Click the **New** button to create a new query using SQL.

SETTINGS

The **Settings** menu lets you configure Vitals Desktop options.

New Valve Browse Valves Print Detail New Activity Browse Activities Activity Report Data Transfer Settings Database Setup Set Language Set Custom Color Vitals Mobil Notification	🚾 Vitals Desktop - E.H. Wachs - Version 3.4.9	
Print Detail New Activity Browse Activities Activity Report Data Transfer Settings Database Setup Set Language Set Custom Color	New Valve	
New Activity Browse Activities Activity Report Data Transfer Settings Database Setup Set Language Set Custom Color	Browse Valves	
Browse Activities Activity Report Data Transfer Settings Database Setup Set Language Set Custom Color	Print Detail	
Activity Report Data Transfer Settings Database Setup Set Language Set Custom Color	New Activity	
Data Transfer Settings Database Setup Set Language Set Custom Color	Browse Activities	
Settings Database Setup Set Language Set Custom Color	Activity Report	
Settings Database Setup Set Language Set Custom Color	Data Transfer	
Database Setup Set Language Set Custom Color	Settings	
Set Custom Color		
	Set Language	
Vitals Mobil Notification	Set Custom Color	
	Vitals Mobil Notification	
	WAUN	
WAUNS	E.H. Wachs	
E.H. Wachs	847-537-8800	

• **Database Setup** has commands for configuring the Vitals Desktop database.



- Set Language displays the Language screen, which allows you to select the default language. The selected language will be automatically configured on Vitals Mobile during the next data transfer.
- Set Custom Color displays a color dialog, allowing you to choose a custom color in which to display the currently open database.
- **Set Notifications** lets you configure how Vitals Mobile notifies you of valve activities that have not been transferred to Vitals Desktop. See the following section.

Notifications

Vitals 3.8 no longer includes the Notifications feature in earlier versions of the software. (Explain why? Alternative required or not?)

HELP OPTIONS

This section describes the options available through the help dropdown menu in Vitals Desktop 3.8.1.



Figure 7-63. Help Options

- About Vitals Desktop displays an about screen with the software version number and the location where the currently open database is stored.
- **Reference Manual** opens a PDF of this reference manual for helpful information regarding the HC-100 controller, Vitals Desktop 3.8.1, and Vitals Mobile 3.8.1.
- **E-Mail Tech Support** opens a blank email message that the user can fill out with questions or concerns. Tech Support emails are sent to the technical/engineering staff at E.H. Wachs.

Chapter 8 Troubleshooting Guide

.....

Symptom: HC-100 not recognized when connected to PC

Many issues can affect HC-100 connectivity to the PC.

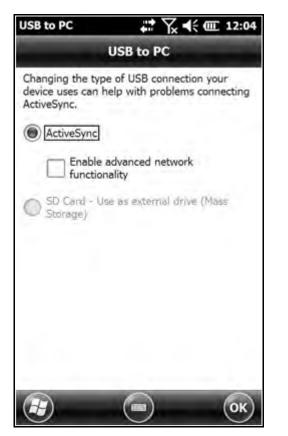
- Issue with Windows Mobile Device Center (WMDC) in Windows 10 (particularly with Windows 10 Creators Update)
 - WMDC will not function by default in Windows 10. Instructions on enabling WMDC are on our website (<u>www.turnvalves.com</u>). Click on "Support", then click on "Software Downloads" for information.
- 2. Problem with Windows Mobile Device Center
 - Check to make sure Windows Mobile Device Center is installed
 - i. Uninstall/remove Windows Mobile Device Center through the Control Panel.
 - ii. Re-install Windows Mobile Device Center from the Microsoft website. (32 and 64 bit installers can be found in C:\Program Files\Vitals Desktop\wm.
 - Firewall settings may prevent drivers from loading
 - Check Mobile Device Settings:

Waiting for device to connect		
Allow USB connections		
Allow connections to one of the following:		
Bluetooth		
This computer is connected to:		
Automatic 👻		
Allow automatic device authentication		
Allow data connections on device when conn	ected to PC	

- 3. ActiveSync settings on HC-100
 - Start Screen > Tap ActiveSync icon > Menu > Connections...

ActiveSync	** Yx	€ @ 3:
Connections	-	
When cradled		
Synchronize all connection:	PCs using thi	is
USB Default		
		0
	0	6

- 4. USB to PC setting on HC-100
 - HC-100 Home Screen > Tap Settings icon > Tap Connections icon > Tap USB to PC icon:



Enable advanced network functionality is off by default.

- 5. Faulty USB cable.
 - Check connection with another USB cable.

Symptom: Running slow or locking up

Occasionally, software programs or the operating system on a device may cease to respond, leaving the device in a state where it cannot be used until some or all software programs are closed or the operating system is reset.

Stop Running Programs

- 1. Open Task Manager on the HC-100 to stop applications or end tasks. (Task Manager is on the HC-100 Home screen - Tap on Home button)
- 2. Tap on Menu > End All Tasks

Soft Reset

 Try soft resetting the device by pressing and holding the Power (On/Off) key for 5-10 seconds until the Power Button menu appears. Tap Reset.

Restoring to Factory State (Clean Boot)

CAUTION: Restoring the HC-100 to its original factory state permanently erases data saved on the handheld, any software you installed, and any changes you made to the handheld, including changes to settings.

- 1. Back up files and programs you want to keep onto another computer.
- 2. Save open files and close running programs on the handheld. Press and hold the power button until the Power Button menu appears. Tap
- 3. Reset.
- 4. When the screen turns black, press and hold the power button again. The BIOS screen is shown.
- 5. Move the top slider on the screen to the right to set or clear factory defaults. This clean boots the handheld.
- 6. Tap *Exit*. The boot process continues.

Symptom: Touchscreen not accurate or responding to touch input

Touchscreen performance can be optimized for individual situation or whether using a finger vs. stylus input.

Adjust Touchscreen Settings

- 1. Settings>System>Touch
- 2. Select Touch Profile (Stylus 10 is the recommended default profile).
- 3. Finger and Stylus profiles available.

Use HC-100 stylus.

1. Wider tip stylus will actually work better the a fine tip stylus because the wider tip will activate more contact points at a time.

Use Hold To Zoom Feature

- 1. Press and hold down P1 button
- 2. Tap on the screen. Area around the tap location will zoom in allowing finer user touch input.
- 3. Release P1 button to zoom out

Soft Reset

 Try soft resetting the device by pressing and holding the Power (On/Off) key for 5-10 seconds until the Power Button menu appears. Tap Reset.

Symptom: HC-100 turning off and rebooting

Low battery

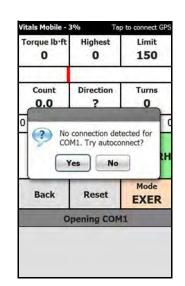
- 1. Charge battery
- 2. Keep HC-100 plugged-in (vehicle DC charger or AC charger) when not in use

Symptom: Vitals Mobile Controller Stops responding

Faulty machine connection

- 1. Soft reset HC-100
- 2. Check connection with Vitals Diagnostics
 - Vitals Diagnostics will not connect to machine with faulty connection. Vitals Mobile accepts an intermittent connection problem.
 - i. Diagnose source of faulty connection: control cable, wiring, connector corrosion, faulty equipment ground, faulty control board.

Symptom: The "No connection" message appears on the HC-100 while operating the ERV-750.



Connection to valve operator interrupted

- 1. Make sure the ERV-750 is powered on.
- 2. Make sure the cable is connected, or that a Bluetooth link has been established.
- 3. Pressing the brake button on an ERV-750 with a version 1.01 control board will interrupt the controller connection.
 - i. Tap Yes to autoconnect and re-establish the connection.
 - ii. If the controller is connected using Bluetooth, it may take 15-30 seconds to re-establish the link.
 - Version 1.01 control boards can be updated. Contact E.H. Wachs service for information.

Symptom: A "Transducer Error" message appears while operating the TM-7 or ERV-750.

The transducer readings from the valve operator are out of normal range. This indicates a problem with either the transducers or cables.

Caution: Vitals uses transducer readings to calculate operating torque. Operating with incorrect readings can cause the machine to break a valve.

nest Limit	Torque lb·ft	Highest	Lim
00 150	4	50	15
ER ERROR	TRA	NSDUCER ER	ROR
tion Turns	Count	Direction	Tur
ault	Critical M	achme Fault	-
? No		Continue? Yes No	
EXER			EXI
,0,3,0		0,220,257,2,	0
	tion Turns ault JCER ERROR MAY BREAK 1. ADC2: 0. No Set EXER	tion Turns ault JCER ERROR MAY BREAK 1. ADC2: 0. RH No set EXER	tion Turns ault DCER ERROR MAY BREAK 1. ADC2: 0. Bet EXER Count Direction Critical Machine Fault O Critical Machine Fault O Continue? No Back Reset

1. Contact E.H. Wachs for service if your valve operator is generating Transducer Error messages.

Tap to o Limit

150

Turns

EXER

RH

Symptom: A "Transducer Zero Torque Error" message appears starting the Vitals Diagnostics Hydraulics Test.

Vitals M 🏝 🛛	obile Diag DIAGNOST	ICS M		4 € 000 4:24 3.4.9.0 ▲
SN N	/A NE TYPE	VCD ERV	1.0 /-750	Joseph Contraction of the second seco
	HYDR		S TE	ST
FLOW				ok ION
MIN MAX BRAKE ON	TRANSDI TORQUE adjust ad manual.	ERRO	R. Plea	
PRES		147	_	Reset
A: 14/ B: 152		14/	_	
RU		152		Back
		DED		
DA				
-∕∖/	V I	TAI	S TM	

1. Adjust the transducer potentiometer. See "Transducer Zero Torque Error" on page 128.

Symptom: Runtime errors while using or installing Vitals Desktop.

- 1. User account related
 - Lacking user account privileges
 - Log in to computer as Administrator
- 2. Vitals desktop related
 - Did not install correctly. Reinstall Vitals Desktop

Symptom: Runtime error shows up after doing a data transfer: Runtime error 53: File not found: rapi.dll.

- 1. Windows Mobile Device Center
 - WMDC is not installed or is corrupted on PC. Install WMDC 6.1 by downloading it from the Microsoft Website.

Symptom: Runtime error shows up after trying to launch Vitals Desktop: Runtime error 75: Path\File access error

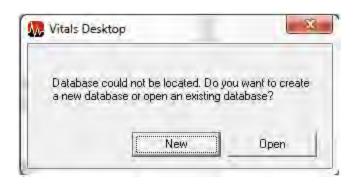
- 1. User account related
 - Lacking user account privileges
 - Log in to computer as Administrator
 - Run Vitals Desktop as Administrator

ompatibility for all users	
	this program and it worked correctly indows, select the compatibility mode version.
Compatibility mode	
Run this program in	compatibility mode for:
Windows XP (Service I	Pack 3) T
Settings	
Run in 256 colors	
Run in 640 x 480 so	reen resolution
Disable visual them	es
Disable desktop con	nposition
Disable display scali	ing on high DPI settings
Privilege Level	
Run this program as	s an administrator

- Allow Full Control to user running Vitals Desktop
 - i. Right click in the Vitals Desktop folder (C:\Program Files\Vitals Desktop) and click **Properties.**
 - ii. Select the **Security** tab and then click **Advanced.**
 - iii. Click **Change Permissions** and then select the users that will be using Vitals Desktop. Click **Edit.**
 - iv. Check the Full control check box and click OK.

bject		
This permission is inherited from th here to override the inherited perm		Make change:
Name: Users (89DPGX1\Users)		Change
Apply to: This folder, subfolder	s and files	
Permissions:	Allow	Deny
Full control		
Traverse folder / execute file	1	
List folder / read data	4	
Read attributes	1	
Read extended attributes	1.1	
Create files / write data	1	
Create folders / append data	V	
Write attributes	V	
	inel	
Apply these permissions to obje containers within this container		Clear All
	Sint.	
Managing permissions		

Symptom: "Database could not be located" message appears when Vitals Desktop is launched.



- 1. Directory related
 - This message will appear if the database is deleted or moved to another location.

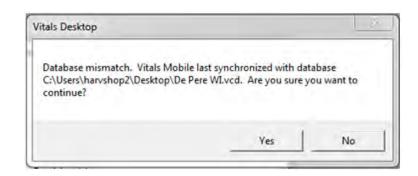
i. To create a new database, click **New**. The Save As dialog appears; name the database and click **Save**.

Documents Music				
Pictures Videos				
		 	-	
File name:				
Save as type:	Vitals Database (".vcd;".mdb)			

ii. To locate the existing database, click **Open**. The Open File dialog appears; browse to the location of the database file, click on the file to select it, and click **Open**.

Favorites	Name	Date modified	Type	Size
E Desktop	test2.vcd	5/13/2015 1:57 PM	VCD File	376 KB
Downloac Dropbox Recent PI	e test335.vcd	5/5/2015 3:47 PM	VCD File	352 KB
Libraries Documer Music Pictures				
Computer				
	File name: test2.vcd		Contraction of the local division of the loc	Database (*.vcd;*.mdb) • pen • Cancel

Symptom: Database mismatch message after performing a Data Transfer.

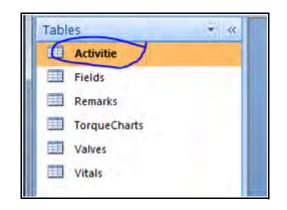


- 1. Directory related
 - This message can appear when the default location of the Database is changed within Vitals Desktop. The file location in the message is the location for the very first database you created.
 - Clicking yes will simply ignore the message and perform the Data Transfer to the database currently opened within Vitals Desktop.
 - To avoid this message, do not change the file location of Vitals Database. Be careful with mapped drives or user level folders. It is recommended to use Windows UNC with an absolute path
 - To eliminate this message, reinstall Vitals Mobile.
 - i. Uninstall Vitals Mobile on the handheld.
 - ii. Remove the Vitals Mobile folder from the File Explorer menu on the handheld.
 - iii. Reinstall Vitals Mobile from the PC running Vitals desktop. (If the location of the database is changed again in Vitals Desktop, the message will re-appear.)

Symptom: "Error validating database" appears after trying to open a database in Vitals Desktop.

Vitals Desktop	8
Error validating database.	
	οκ

1. Database table was changed with MS Access.



- One of the tables in the database was renamed using MS Access. In this example, the **Activities** table was renamed to **Activitie** (note the missing "s" at the end). These tables should not be renamed.
 - i. To fix this, open Microsoft Office Access, **Open**, and change the type to All Files.

	-		
	4	All Files	
Tools	+ 1	Open 🔻	Cancel

ii. Select the database with **.vcd** extension and open it

- iii. Right click on the table and click Rename.
- iv. Rename to Activities.
- v. Close Microsoft Office Access and open the database with Vitals Desktop.
- Tables required by Vitals are as follows: Activities, Fields, Remarks, TorqueCharts, Valves and Vitals. If these are missing or named differently, there will be problems when trying to open the database.

Symptom: "Mobile database is locked" message appears when performing a Data Transfer.

tals Desktop	X
Mobile database is locked. Please return to the Vitals Mob try again.	ile startup screen and
	ОК

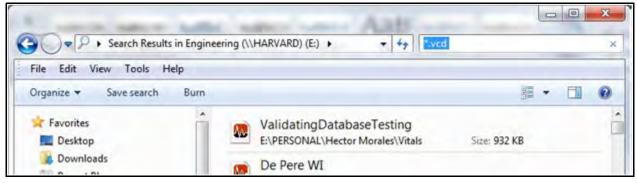
1. User Error

- This error message pops up when Vitals Mobile is not on the main screen.
 - i. Make sure Vitals Mobile is at the following screen, and then click on **Data Transfer** in Vitals Desktop.



Symptom: Can't find database (.vcd file) that was transferred from handheld controller to Vitals Desktop.

- 1. Directory related
 - Created a new database and saved it at another location and thus changing the default directory.
 - i. Perform a computer search by typing "***.vcd**" in the search bar. (This is the extension for the database file when it is transferred to Vitals Desktop.)



- Click on Open Database under Database Setup and point to the directory containing vitalsdb.vcd.
- 1. Database file deleted or overwritten.

Symptom: No COM ports are available for Bluetooth pairing.

- 1. COM ports were not released when previous Bluetooth pairings were deleted.
 - Run the **BT Clean** app on the HC-100 to remove all COM port assignments and Bluetooth pairings. (If BT Clean is not on your HC-100, download it from the website at <u>turnvalves.com</u>. Click "Support", then click "Software Downloads".)

i. Tap the **BT Clean** icon to start the app.



ii. When the app opens, tap the **Clean Reg** button.

BT_CleanReg V1.0 👔 🗰 🏹 ┥< 🗰 2:48 BT_CleanReg V1.0 🗙
Clean Bluetooth Registry
Status:
Clean Reg Exit / Cancel
Wi-Fi Plashight off On
111111
System Info
System Info Settings Task Manager Vitals Mobile

iii. Tap the **OK** button to reset the ports and restart the handheld controller.



iv. When the ports have been cleared, you can reestablish the Bluetooth link to the valve operator. Tap **Add new device**.



Symptom: Error message saying "Cannot find E. H. Wachs equipment.

- Valve operator may not be powered on.

 Turn on the valve operator.
- 2. Bluetooth not connected.
 - i. Make sure the equipment is paired. See "Adding a Valve Operator" on page 40.

Symptom: Maps view not available in the field.

- 1. TC-100 is offline and local map is not downloaded.
 - Download local map when connected to wi-fi. Tap the Windows icon, go to Settings, then Apps>Offline Maps. Find your location and download the map.

Symptom: Query for All GPS Data comes back blank.

- 1. The GPS query requires valve geolocation data to return results.
 - i. Best practice is to have the valve latitude and longitude coordinates stored in the Valve table, using the most precise geolocation data available.
 - ii. Geolocation data in the Valve table is not required, if the valve has at least one activity in the Activities table with location data.

Chapter 9 Ordering Information

To place an order, request service, or get more detailed information on any E.H. Wachs Company products, call us at one of the following numbers:

U.S. 800-323-8185

International: 847-537-8800

Or you can visit our website at:

www.turnvalves.com

ORDERING REPLACEMENT PARTS

When ordering parts, please provide the part description and part number for all parts you are ordering.

REPAIR INFORMATION

Please call us for an authorization number before returning any equipment for repair or factory service. We will advise you of shipping and handling. When you send the equipment, please include the following information:

- Your name/company name
- Your address
- Your phone number

In This Chapter

ORDERING REPLACEMENT PARTS REPAIR INFORMATION WARRANTY INFORMATION

RETURN GOODS ADDRESS

- A brief description of the problem or the work to be done
- The RMA number printed on the outside of the box or container.

Before we perform any repair, we will estimate the work and inform you of the cost and the time required to complete it.

WARRANTY INFORMATION

Enclosed with the manual is a warranty card. Please fill out the registration card and return to E.H. Wachs Company. Retain the owner's registration record and warranty card for your information.

RETURN GOODS ADDRESS

Return equipment for repair to the following address.

E.H. Wachs—Water Utility Products 600 Knightsbridge Parkway Lincolnshire, Illinois 60069 USA

Appendix A Vitals Valve Exercising Program

Vitals provides two modes of valve operation.

- The 'EXERCISE' mode is designed to close and open (exercise) a valve as part of a maintenance routine, with minimal risk of damage to the valve.
- The 'EMERGENCY' mode is used when the valve must be closed quickly; a higher risk of valve damage is acceptable for the sake of speed.

The main difference between the modes is that the rate at which torque is increased is greater in the EMERGENCY mode.

The valve turning program relies on several control modes as the machine works through the valve turning process. The control mode of the machine varies based on the state of the valve turning operation (direction to turn the valve, valve stuck or turning) and the mode of operation.

Function Overview

At the start of the valve turning operation, the machine (and likely the user) has no way to know what state the valve is in when the machine is first connected. The torque required to turn the valve is unknown and the valve could be fully open, fully closed, or anywhere in between.

The machine starts with a torque LIMIT of 100 ft-lbs, but the machine attempts to move the valve back and forth with a lower torque call the SETPOINT. The machine attempts to turn the valve up to the torque set by the SETPOINT. If it is not successful, the machine changes directions and tries again. The SETPOINT is then increased by a value dependent on the operating mode (EXERCISE or EMER-GENCY), then the machine tries again.

The SETPOINT continues to increase, if the valve does not move, until it reaches the LIMIT. At this point the operator must decide to increase the LIMIT or try again at the same LIMIT. The LIMIT cannot be increased until the machine has tried to turn the valve at each of the SETPOINT torques and the required number of tries at the current LIMIT.

At the beginning of the valve turning operation, the direction to turn the valve is unknown. The user may optionally choose a direction for the machine to turn. Otherwise, the machine attempts to turn the valve in either the right hand (RH) or left hand (LH) direction until a specified number of turns (depending on EXERCISE or EMERGENCY mode) is reached.

Once an operating direction is established, it is referred to as the FORWARD direction regardless of whether it is RH or LH. Likewise REVERSE is the opposite of that direction. During the operation, if the valve reaches a point where it cannot be turned at the current torque, the machine attempts to work past the tight spot by reversing and incrementing SETPOINTS.

Jogging

In order to align the machine with the valve, it is often necessary to move the machine a small amount. This is accomplished with the JOG function. The direction of operation is set by the user. This is done by pressing a 'JOG RIGHT' or JOG LEFT" button on the controller. The torque limit is set to the current *LIMIT*. Operation continues in that direction until the button is released or the *LIMIT* is reached.

Manual Mode

This mode implements full control by the user. The user has complete control of the machine direction. Torque is limited only by the LIMIT value and LIMIT may be incremented at any time.

Appendix B Vitals Database Reference

The Vitals database is stored in MS Access format. Vitals has its own file type, with a **.vcd** file extension.

There are 6 tables in the database. Four of them store the valve and activity data:

- Valves, which contains information about the valves and has a unique ValveID for each valve.
- Activities, which contains activity data and is linked to the Valve table by ValveID. Each activity has its own ActivityID.
- TorqueCharts, which contains torque information for each activity and is linked to the Activity table by ActivityID.
- **Remarks**, which contains pre-defined remarks that the user can select while doing an activity.

The other 2 tables store customer and database information:

- Vitals contains version and administrator information.
- Fields contains settings and field lookup information.

TABLE STRUCTURE

The following charts illustrate the field structure of each Vitals database table.



Field size is in characters unless specified otherwise.



CAUTION

Field names marked with an asterisk (*) must not be deleted from the Vitals database structure. If you are editing the database structure, do not remove these fields. **Removing these fields will cause database errors.**

Valves Table		
Field Name	Data Type	Size
Valveld*	Text	20
Size*	Double	8 bytes
NormPosn*	Text	10
Close Dir*	Text	10
Condition*	Text	20
Туре*	Text	20
Depth*	Integer	2 bytes
Street*	Text	20
Cross Street*	Text	20
Notes*	Memo	64000
Latitude	Double	8 bytes
Longitude	Double	8 bytes

Activities Table				
Field Name	Data Type	Size		
ValveId*	Text	20		
Date*	Date	8		
OperatedBy*	Text	10		
Turns*	Double	8 bytes		
Position*	Text	10		
HighTorque*	Integer	2 bytes		
Begin Time*	Text	10		
End Time*	Text	10		
Remarks*	Text	100		
Latitude*	Double	8 bytes		
Longitude*	Double	8 bytes		
GPS Positions*	Integer	2 bytes		
ACtivityId*	Long Integer	4 bytes		
TransferId*	Text	20		

NOTE: The Remarks field contains remarks that the user has selected on the handheld controller while performing an activity.

TorqueCharts Table		
Field Name	Data Type	Size
ActivityID*	Number	2147483647
		Max Value
ChartData*	Memo	64000

Remarks Table			
Field Name	Data Type	Size	
RemarkID*	Text	4	
Description*	Text	20	

NOTE: Fields in the Remarks table appear as checkboxes in Vitals Mobile. The user can select these checkboxes to add the remarks to the activity record.

Fields Table			
Field Name	Data Type	Size	
FieldName*	Text	50	
Caption*	Text	50	
Choices*	Memo	64000	

NOTE: The Fields table stores pre-defined contents that the user can select from on the handheld controller.

For example, if you add a record to the table with the following values:

- FieldName: Size
- Caption: Valve Sizes
- Choices: 4;6;8;10;12;16;24

the user will see the choices in a pull-down list under Valve Sizes. Selecting one of the choices will enter it into the valve record.

You can edit the choices for an existing field, or create new fields in other tables and specify their content in the Fields table.

Vitals Table				
Field Name	Data Type	Size		
Version*	Text	50		
CompanyName*	Text	50		
AdminPassword*	Text	50		
LockValves*	Yes/No	64000		