

INGERSOLL RAND
PORTABLE POWER
Mocksville, N.C.



USER'S GUIDE

VIRTUAL TECHNICIAN
Service Tool





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VIRTUAL TECHNICIAN

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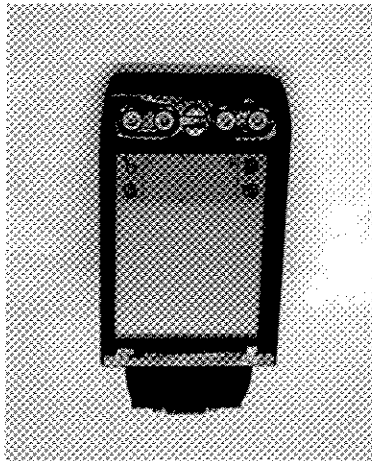




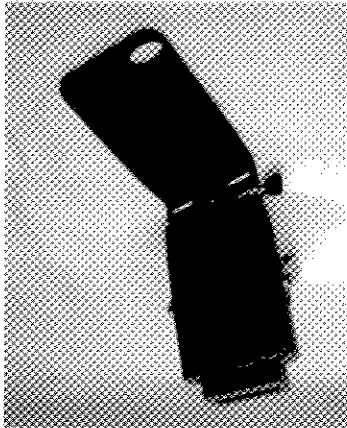
1.0 General Overview

The **VIRTUAL TECHNICIAN** is a PDA (Personal Digital Assistant) based service tool. The tool provides the capability to re-program a WEDGE or INTELLISYS controller and extract the fault log from these controllers. The tool also retains all of the functions of the PDA. The Ingersoll-Rand functions are a menu option like any other PDA menu option.

The PDA selected for the tool is the Handspring, Inc. Platinum model. It is a basic PDA with 16M of memory. It has the Springboard module interface and throw-away batteries. Below is a picture of the Platinum PDA and RS232 Springboard module.



The protective holster is used to provide some protection from physical damage and bad weather conditions. A handle is provided to allow hanging the unit in a machine or providing a stand so the unit can sit up on a horizontal surface.

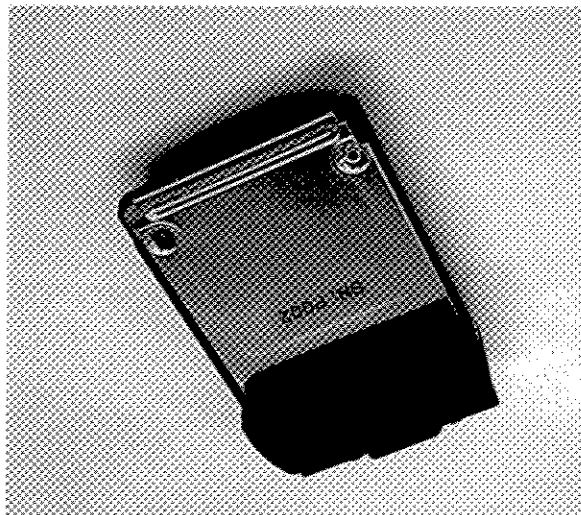




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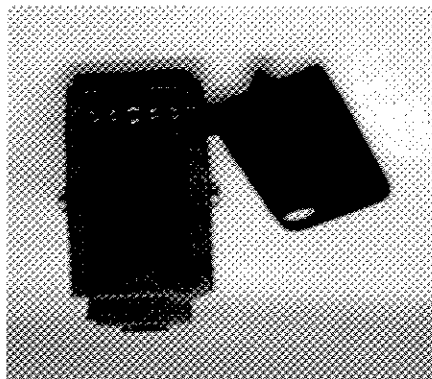
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The RS232 Springboard module is a custom interface unit that provides a RS232 input to the PDA. Connection through a springboard module provides a reliable connection method. The holster helps hold the springboard module in place. A rugged serial cable is provided to connect the **VIRTUAL TECHNICIAN** to the RS232 connector on the machine.



Currently, the **VIRTUAL TECHNICIAN** has two functions: 1) controller re-programming and 2) Fault load extraction from controller. Additional features will be added. These will require a simple software upgrade to the PDA, and possibly the machine controller.

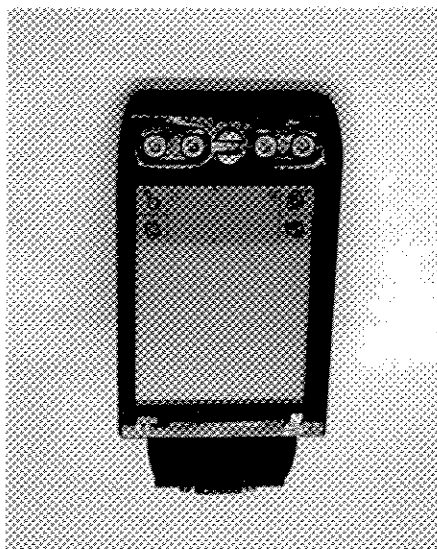
The picture below shows the PDA with springboard installed in the holster, ready for use.





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*The WEDGE controller must have V1.50 or greater
software and the INTELLISYS must have V1.64 or greater
software to use the Fault Log function of Virtual
Technician*

Refer to the Handspring "Quick Reference Guide" that is packed with the PDA materials. It is a 5" X 5" green document. It provides a basic operation guide for the PDA.

2.0 Unpacking the Service Tool

The **VIRTUAL TECHNICIAN** kit contains the PDA with springboard module installed, PDA cradle, serial cable, CD's with software and manuals. If any of these items are missing, contact Ingersoll-Rand Customer Support at 800-633-5206 to get the missing components. The picture below shows the contents of the kit.



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Service Tool Kit

The part numbers are as follows:

Item	I-R P/N
PDA Service Tool Kit	54729728
Handspring Platinum PDA	54729728
Holster	22230395
Holster Cover	22237739
Handle	22246185
RS232 Springboard Module	22226161
RS232 Serial Cable	54740675

The service tool is shipped programmed with the latest version of **VIRTUAL TECHNICIAN** software. If the need arises to re-program the tool, a CD is included in the kit with the software.



3.0 Setup of the Handspring Platinum PDA

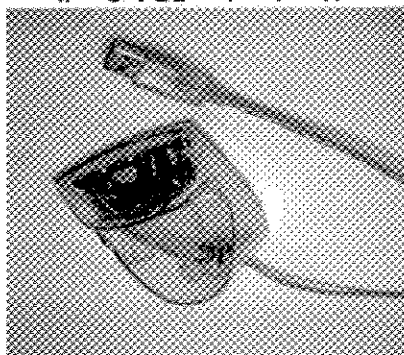
Included in the service tool kit is the Handspring Platinum manual. This manual describes the basic operation of the PDA. All of the basic PDA features have been retained. The Ingersoll-Rand **VIRTUAL TECHNICIAN** software package has been added to the unit.

4.0 Loading The **VIRTUAL TECHNICIAN** Software

The **VIRTUAL TECHNICIAN** is shipped with the software loaded. The following instructions can be used to load software upgrades.

The CD ROM with the kit contains the software. It must be loaded using a personal computer. A desk top or lap top computer can be used.

Remove the clear plastic cradle from the service tool kit. This is the clear plastic device with the attached cable. On the end of the cable is a USB port connector. Connect this plug to the USB connector on the desk top or lap top computer. Your computer must have this USB connection in order to load the software.



Handspring PDA Cradle

Follow the instructions in the Handspring manual for setting up the hot sync operation. The hot sync is used to program the Ingersoll-Rand **VIRTUAL TECHNICIAN** software into the PDA. The following steps describe the software loading process.

Step 1:

Insert the **VIRTUAL TECHNICIAN** CD into your computer's CD drive. This is usually drive D.

**Step 2:**

Click on the "START" button at the lower left of your screen. When the menu appears, click on the "RUN" selection. Next click "BROWSE". Select the "D" drive from the list of selections for your computer. Next double click on "PDA Service Tool Installation" and double click on "Base Installation" and then double click on "Setup.exe". This will start the execution of the loader program for the **VIRTUAL TECHNICIAN**.

Step 3:

The startup screen will appear, click "NEXT" at the bottom right. On the next screen, click in the box beside virtual technician and then click "NEXT". The program will complete the configuration process and a screen will appear indicating it is complete and to run the hot sync manager. Click the "OK" on this screen.

This completes the setup of the loader program.

Step 4:

Remove the PDA from the holster and place it into the cradle. (The hot sync software must already be installed and the PDA cradle connected to your computer). Press the hot sync button on the front of the cradle. The hot sync process will begin and run until completion. If the process ends with no errors, the next step is to load the **VIRTUAL TECHNICIAN** software into the springboard module on the PDA.

Step 5:

Remove the PDA from the cradle. Tap the "House" symbol on the lower left of the PDA screen. The main menu will appear. Tap the down arrow on the right to go to page 2 of the menu. The Ingersoll-Rand logo will appear on the right side. Tap the I-R logo. A screen will appear entitled "SOFTWARE INSTALLATION". Tap "OK" at the lower left.

Another screen will appear entitled "IR Module Flash Updater". Tap the box "Update Now" in the middle of the screen. Another screen will appear entitled "Update Software". Tap "OK" on this screen. This will start the memory programming process. It will take a few seconds to complete.

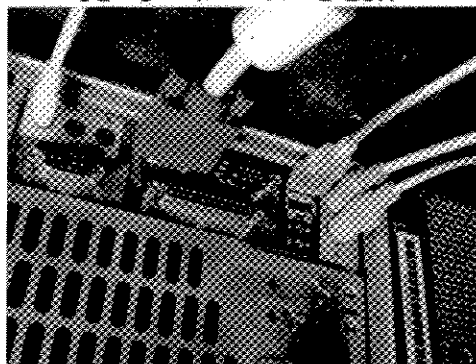
When complete, a screen entitled "Reset" will appear. Tap the "Reset" in the left corner. This will complete the loading process.



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The **VIRTUAL TECHNICIAN** is now ready for use.



5.0 Loading Hex File into the PDA

The hex file that is loaded into the WEDGE or Intellisys controller is contained on the CD that has the **VIRTUAL TECHNICIAN** software. It is loaded at the same time the **VIRTUAL TECHNICIAN** software is loaded.

V1.52 software is included with the kit. If this hex file is later changed, a CD will be issued containing the new software.

6.0 Connecting the PDA To A Controller

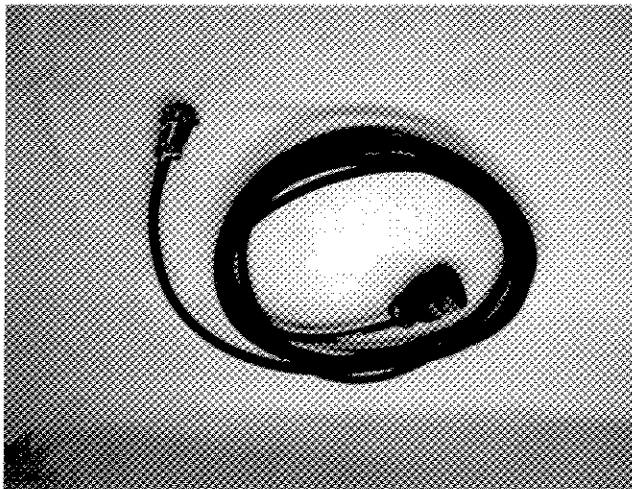
The black serial cable in the kit is used to connect the PDA to a controller on a machine. One end of the cable has a DB9 style connector that connects to the RS232 Springboard module that is inserted into the PDA. The other end of this cable has a 9-pin Deutsch connector that connects to the serial port connector on the machine. This connector is usually located inside the control panel and usually labeled as J5. This is the only connector on the machine the 9-pin serial cable connector will mate with.

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Serial Cable

7.0 Re-Programming a Controller

Before a controller can be re-programmed, the .Hex file for the new version software must be loaded into the service tool. This is done using the PDA cradle connected to a desk or lap top computer. The Hot Sync feature of the PDA is used to transfer the software. Refer to section 5.0 for details on loading the .Hex file.

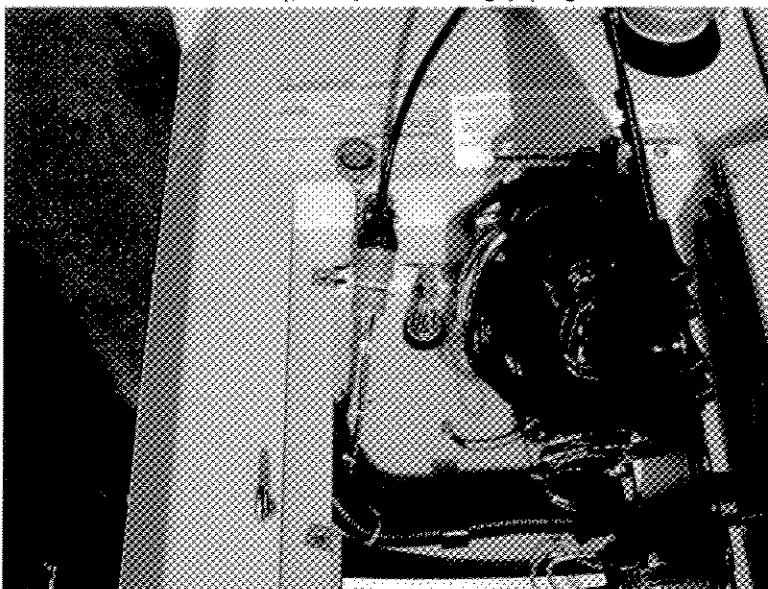
First, connect the serial cable to the RS232 connector on the machine. This connector is usually located inside the control panel or located as a stub on the harness near the controller. It is a nine pin circular connector with a quarter turn to lock the two halves of the connectors together.

Next connect the other end of the serial cable to the service tool. This will be the nine pin (DB9) on the springboard at the top of the service tool. Screw in the jack screws to hold the connector onto the springboard.



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Serial Connector Location

Turn on the service tool by tapping the key in the lower left corner with the green dot (Refer to Handspring manual for PDA features), using the stylus. The stylus is stored in the top portion of the holster next to the RS232 connector. Next tap the house symbol that is on the lower left side of the PDA screen. This will display the main menu. The main menu has two pages, so tap the lower part of the down arrow at the right side of the first page to go to the second page of the menu. The arrow appears on the right side of the PDA screen.

The Ingersoll-Rand icon will appear on the second page of the main menu. Tap the icon to enter the **VIRTUAL TECHNICIAN** software. The screen will display two options: download or fault log. Tap the download box. The version of the hex file will be shown at the top of the screen along with the time and date it was created.

If the serial cable is not connected, a window will appear requesting the serial cable be connected to the machine. If the serial cable is connected, tap the OK box. The service tool will download the hex file into the controller. The records loaded will be counted down on the display as it loads. Loading time is approximately 2.5 minutes for V1.52.

8.0 Fault Log Extraction

The fault log is a record of the last 25 shutdowns that have occurred. It is stored in the controller's non-volatile memory so it is not lost at power down. The current software version numbers the faults and displays the most current fault first. The second most recent fault is displayed next and so on.



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A snap shot of the machine parameters are stored with each fault. This snap shot was taken when the fault occurred. The snap shot could be useful in the troubleshooting process, especially with intermittent problems.

The fault log appears as follows:

Fault Log Record Number 1

Parameters

Alarm Code = 53
IQ Filter Switch = OPEN
Fuel Alert Switch = CLOSED
Fuel Shutdown Switch = CLOSED
Service Air Switch = OPEN
Air Filter Switch = OPEN
Air End Oil Pressure Switch = CLOSED
Estop Switch = CLOSED
Start Switch = OPEN
Engine RPM = 1535 RPM
Reg. System Pressure = 35 PSI
Sep. Tank Pressure = 51 PSI
Discharge Temperature = 95 F
Sep. Tank Temperature = 65478 F
Target RPM = 1500 RPM
Machine Type = 0
Engine Coolant Temperature = 78 F
Engine Fuel Pressure = 65535 PSI
Engine Oil Temperature = 78 F
Engine Oil Pressure = 47 PSI
Intake Manifold Temperature = 73 F
Throttle Position

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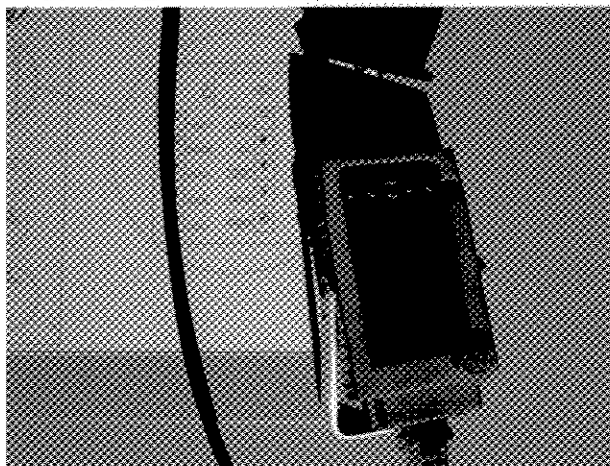
Boost Pressure = 6PSI
Engine Hours = 65535
Engine Load = 34%
Engine Fault 1 = 0
Engine Fault 2 = 0
Engine Fault 3 = 0

The "Alarm Code" is the shutdown code. A list of these can be found in the Electrical/Electronic Service Manual for the particular machine. All switch type inputs have two states: OPEN or CLOSED. Up to 3 engine faults are listed. The engine fault number can be found in the Electrical/Electronic Service Manual with a corresponding explanation.

Anytime a number such as 65XX appears for the parameter, it means this parameter is not currently monitored. The number 65,535 is an out of range value read by the controller.

There is a box at the bottom of the fault log listing "View Shutdown Code". Tapping this box will show a window with the name of the shutdown code and another box labeled "Troubleshooting". Tapping the "Troubleshooting" box will list a description of the fault and information on how to troubleshoot the problem.

Connect the service tool to the machine using the serial cable as described earlier.





9.0 PDA Battery Management

Typical battery life on the **VIRTUAL TECHNICIAN** should be from 1 to 3 months. This will depend upon usage. A low battery indication is issued by the Platinum PDA. When this occurs, the batteries should be replaced before they go completely dead. The battery indication is shown on the main menu page at the upper left of the screen. There is a picture of a battery. The battery is filled in according to the charge level.

There is an internal capacitor that powers the memory while the main batteries are being replaced. Do not leave the main batteries out of the PDA for any extended period. Once they are removed, replace them with fresh ones immediately. The internal capacitor can power the memory for 1 minute.

The PDA uses two AAA alkaline batteries that are available at many retail outlets. Alkaline batteries are recommended for maximum use time. Standard carbon battery type can also be used.

If the batteries go completely dead, all information entered into the PDA will be lost. EXCEPT FOR THE VIRTUAL TECHNICIAN PROGRAM. It is stored in flash memory in the springboard module. Information stored in the PDA, such as phone numbers and addresses, are saved to the PC using the hot sync process. If they are lost due to dead batteries they can be recovered using hot sync. See the Handspring manual for further information.