DATREND Systems Inc.

vPad-EQM™

Equipment Management App for vPad Safety Analyzers

Operating Manual

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for vPad Safety Analyzers

Operating Manual

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DATREND Systems Inc.

To order this manual, use Part Number 6100-047

Revision	Revision History Description	Date
A	Initial release	2013-Dec-12
B	Update to V1.10.4	2017-Mar-14

Unpacking and Inspection

Follow standard receiving practices upon receipt of goods. Check the shipping carton for damage. If damage is found, stop unpacking. Notify the freight carrier and ask for an agent to be present while the goods are unpacked. There are no special unpacking instructions, but be careful not to damage the goods when unpacking. Inspect the goods for physical damage such as bent or broken parts, dents, or scratches.

Claims

Our routine method of shipment is via common carrier. Upon delivery, if physical damage is found, retain all packing materials in their original condition and contact the carrier immediately to file a claim.

If the goods are delivered in good physical condition but does not operate within specifications, or if there are any other problems not caused by shipping damage, please contact your local sales representative or DSI immediately.

Standard Terms and Conditions

Refunds & Credits

Please note only serialized products (products labelled with a distinct serial number) and accessories are eligible for partial refund and/or credit. Non-serialized parts and accessory items (cables, carrying cases, auxiliary modules, etc.) are not eligible for return or refund. In order to receive a partial refund/credit, the product must not have been damaged, and must be returned complete (meaning all manuals, cables, accessories, etc.) within 90 days of original purchase and in "as new" and resalable condition. The *Return Procedure* must be followed.

Software which has been activated may not be returned for credit. Us it in Demo mode where possible to ensure suitability for purpose.

Return Procedure

Every product returned for refund/credit must be accompanied by a Return Material Authorization (RMA) number, obtained from Datrend Customer Service. All items being returned must be sent *prepaid* (freight, duty, brokerage, and taxes) to our factory location.

Restocking Charges

Product returned within 30 days of original purchase are subject to a minimum restocking fee of 15%. Product returned in excess of 30 days after purchase, but prior to 90 days, are subject to a minimum restocking fee of 20%. Additional charges for damage and/or missing parts and accessories will be applied to all returns. Product which is not in "as new" and resalable condition, are not eligible for credit return and will be returned to the customer at their expense.

Certification

This instrument was thoroughly tested and inspected and found to meet DSI's specifications when it was shipped from the factory.

Where applicable, calibration measurements are traceable to the National Research Council of Canada (NRC) and/or the National Institute of Standards and Technology (NIST). Devices for which there are no NRC/NIST calibration standards are measured against in-house performance standards using accepted test procedures.

Warranty and Product Support

Software Applications (Apps) for use in conjunction with ES601 and vPad Safety Analyzers and other Datrend Products are supplied subject to the Terms and Conditions agreed to by the act of Activating the App. In the event no Activation is required, the Terms and Conditions published on the Datrend Systems Inc. (DSI) website shall prevail. By using the App, you agree to these terms and Conditions. IN NO EVENT SHALL DATREND SYSTEMS INC. BE LIABLE FOR CONSEQUENTIAL DAMAGES.

DSI DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION.

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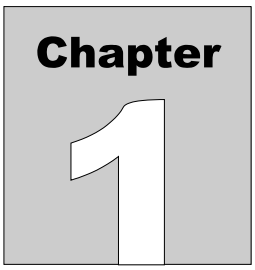


1 Specifications

vPad-EQM™ is a software application (App) which provides a basic equipment database management system with the additional capability to track work orders assigned to specific equipment items.

The equipment database contains the following fields:

ControlNumber
Description
SerialNumber
Manufacturer
Model
Location
Facility
Checklist
TechCode
Schedule
LastDate
NextDate
Status
RiskManagement
AEM
Address1
Address2
Address3
SoftwareVersion
Department
Room
Edited
ActiveState

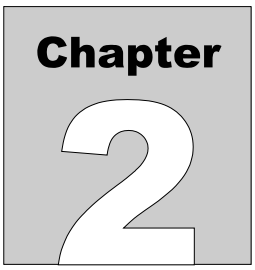
Note, to be compatible with the nomenclature for fields in other systems, it is possible to map the 'native' field names to an alternate set of names.

The work order database contains the following fields:

"WorkOrder"	This is a unique entry, identifying the work or job
"ControlNumber"	This is the unique ID of the device to be tested
"Description"	The description of the problem to be corrected
"Open_Date"	The date the WO was opened
"Closed_Date"	The date the WO was closed
"Report_Filename"	The filename of the test report

"Status"	Typically PASS or FAIL
"TechCode"	As in the Equipment list above
"WOType"	User defined in a text file list WorkType.txt, in Datrend\Database folder
"ReportedDate"	Normally the same as Open_Date
"ReportedBy"	Person reporting the problem
"ContactInfo"	How/where to contact the person above
"Checklist"	The name of the Checklist to follow
"PassDateReported"	A flag indicating that the ReportedDate data should be included in the test report
"PassProblemBy"	A flag indicating that the ReportedBy data should be included in the test report
"PassContactInfo"	A flag indicating that the ContactInfo data should be included in the test report
"PassProblemDesc"	A flag indicating that the (Problem)Description should be included in the test report
"Exported"	A flag indicating that the Work Order has been exported to an external device

vPad-EQM works in conjunction with vPad-Check™ to automate testing by allowing activation of the specified equipment Checklist via the equipment or the work order database.



2 Overview

Not everyone has or needs a comprehensive CMMS system to organize and track information on their medical device inventory, and the associated service and preventive maintenance it receives. Some may have an equipment asset system that deals with the financial aspects of equipment management, but does not deal with service or preventive maintenance. Others may have a home-grown system which does not have the ability to create and perform specific 'automated' procedures as part of a scheduled preventive maintenance program. vPad-EQM is designed to help fill this gap and enable a basic level of test automation in the absence of these major systems.

2.1 Features

2.1.1 Equipment Database

vPad-EQM contains the basic, essential equipment information required to organize and manage your equipment inventory. It is not intended to replace an existing CMMS or Asset management program, but to supplement their use if they do not have test automation or on-line work order capabilities. In cases where a user does not have one of these major systems, vPad-EQM provides an economical alternative until a more comprehensive system is justified.

The Equipment Manager database can be populated by importing data from another source, or can be created on-line, as new pieces of equipment are encountered.

Part of the equipment database is a link to the appropriate automation Checklist for each device. Working in conjunction with the vPad-Check App (pre-requisite), a Checklist can be **RUN** directly by selecting a specific device. Vpad-Check comes with a good cross-section of example Checklists. These Checklists are not warranted to follow any particular manufacturer's recommended practice, and are provided for guidance purposes only. These Checklists may be modified to suit the user's purposes using a text editor or the vPad-IDE program. Consult the vPad-Check Operator's Manual for a full description on the use of the vPad Programming Language (VPL) capabilities and functionality.

2.1.2 Work Order Database

To keep track of work to be done, and work completed, vPad-EQM's Work Order database provides the ability to open work orders linked to a specific device. A work order can also be **RUN** once a piece of equipment has been linked to it. When a work order is completed, it will be closed in the Work

Order database, and the test report file name is stored in the record. The Last PM Date and the Next PM Due date will be updated in the Equipment Manager.

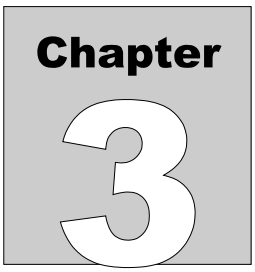
The Equipment Manager and Work Order databases work in tandem to provide a complete history of device service and preventive maintenance.

2.1.3 Test Automation

vPad-EQM completes the test automation loop by allowing the inclusion of device specific Checklists in the Equipment Manager database, and the ability to **RUN** these Checklists directly through vPad-Check. Test automation Checklists can easily be developed or modified to suit generic equipment groups and/or specific device models. Checklists can include direct interaction with other test devices (e.g. Defibrillator testers) for the full automation experience and to maximize the time savings that test automation has to offer.

2.1.4 Equipment/Work Order List Import/Export

In many cases, a user will have been using some type of asset management system, or possibly a home-grown maintenance management program. These programs typically do not have a test automation component. They generally are, however, capable of outputting an Excel spreadsheet containing (most of) the basic equipment information vPad-EQM needs. They may also be able to export/import work order information to some degree. vPad-EQM can import and export both the Equipment Manager and Work Order databases using the Excel spreadsheet/CSV format. This allows information on central based PC systems to be kept in-sync with the vPad-EQM databases.



3 Installation

The vPad-EQM App is normally pre-installed on the vPad tablet, but may not have been placed on the Home screen,  , of the Android tablet. Go to the Apps screen by pressing the Apps icon  , which may be found on the favourites task bar at the bottom of the screen, or in the upper right corner of the Home screen (tablet and Android build dependent). Find the vPad-EQM icon and press on the icon for several seconds. You will be able drag and drop the icon to the Home screen.

In order to use the App it will need to be activated. When the App is started for the first time, the activation screen will be presented. Enter the activation code provided by your dealer to allow the App to run.

In the event that vPad-EQM is not on the tablet, contact your dealer and it will be provided via download.

Chapter 4

4 Operation

4.1 Startup Screen

Press the vPad-EQM icon, 

, to start the App. A splash screen will be displayed for a few seconds, showing the product name and the software version.

4.2 Equipment Manager

vPad-EQM starts on the **Equipment Manager** screen, with a display of the Equipment List, sorted by the column/order displayed, and the action that was enabled (**Run** or **Edit**) when the App was last exited.

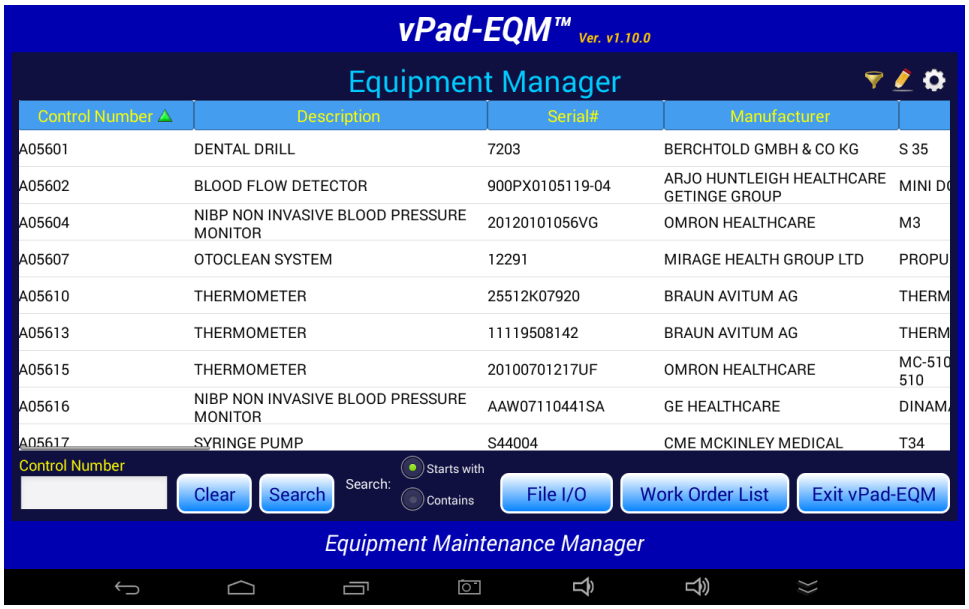
4.2.1 Equipment List

The equipment database or **Equipment List** contains 23 parameters, 21 of which are displayed on the screen in a vertical/horizontal list box, with the other 2* as non-visible flags. The parameters/database fields are:

"ControlNumber"	a unique identifier for the device, assigned by the owner. Also known as device_ID, asset#, tag#, etc.
"Description"	a textual description of what the device is or does
"SerialNumber"	a unique identifier for the device, assigned by the manufacturer
"Manufacturer"	the name of the company that manufactured the device
"Model"	a designator for the device, used to distinguish this device from other similar devices from the same manufacturer
"Location"	a physical position within the facility that the device is normally found (eg. EMERG, ICU, RM 103, WARD4, etc.)
"Facility"	the name of the building, complex where the device normally found (eg. Essex General Hospital, Mercy Hospital Pheonix, etc.)
"Checklist"	the name of a list of actions to be followed when performing a routine inspection of a device. The actions are also commonly known as tasks or items. The Checklist may also be known as a Procedure, Check Procedure, PM Procedure, etc.
"TechCode"	an abbreviated version of a technicians name. Can be formed from the initials or assigned by the facilities administration (eg. an employee number)
"Schedule"	the planned number of months between inspections based on the Checklist
"LastDate"	the last date that the device was inspected according to the Schedule
"NextDate"	the date that the device is due for an inspection according to the Schedule
"Status"	this is the Status of the last inspection performed since the data on the tablet was last updated. This field would typically contain a PASS or a FAIL designation based on the result of the last inspection performed, and would be blank when the data is updated from the PC
"RiskManagement"	data related to risk management of the device, could be a description, a code
"AEM"	data related to the 'alternate equipment maintenance' status of the device
"Address1"	address of the facility
"Address2"	address of the facility
"Address3"	address of the facility
"SoftwareVersion"	software version(s) in the device
"Department"	department in the facility where the device is located, or to which the device belongs
"Room"	room number in the facility where the device is located
"Edited" *	a flag indicating if the equipment record data has been changed since the last update. This field would be blank when data is sent to the tablet, but may contain data indicating the data has been edited on the tablet when the data is sent back to the PC.

"ActiveState" * a flag indicating if the device is in active use

Note, to be compatible with the nomenclature for the fields in other systems, it is possible to map the 'native' field names to an alternate set of names. See 'Settings\Hide Columns' below.



4.2.1.1 Scrolling

The parameters are displayed in columns on the screen, in the order listed previously. Since all the columns can not fit on the screen at once, other columns can be made visible by scrolling the list view horizontally using a swipe motion (left to right, or right to left) until the field of interest is available.

In the list view, each row represents one device. Additional devices can be displayed by using an up or down swipe motion to scroll through all of the available devices. If there are a lot of devices in your database, it may be faster to use the **Search** feature to find or get close to the device of interest.

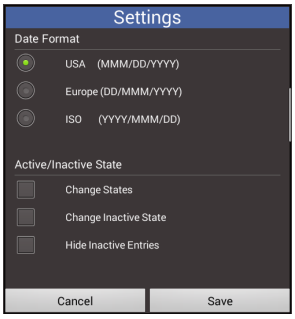
Each of the columns has a name, shown in the title bar of the list view. Touching the name in the title bar will select that column for sorting. A sort direction icon will appear beside the name of the column, ▲ for ascending (start at 'a' or '0') or ▼ for descending (start at 'z' or '9'). Selecting a column name will also select that column as the **Search** parameter. Note that sorting the Date column may not produce the expected results, as the sort is alphanumeric starting with the first character in the field.

4.2.1.2 Settings

While in the Equipment Manager, there are certain **Settings** that control some aspects of the displayed information or what will happen when a device row is touched. The settings icon, , is at the upper right corner of the display. Under **Settings** you can set the following:

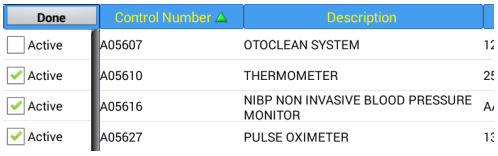
Action:	Run or Edit/Create	
Show:	All:	Shows all of the equipment in the list, regardless of its PM status
	PM Due:	Shows only those devices having a PM due meeting the requirements of the following filter criteria: as of today; today + 7 days ; or today + 30 days
Date Format:	USA (mmm/dd/yyyy) Europe (dd/mmm/yyyy) ISO (yyyy/mmm/dd)	

To access additional selections, scroll down in the **Settings** window. Additional settings are shown below.



Active/Inactive States: Change State

The state of a device may be active or inactive. If you check this box and touch **Save**, a new column will be displayed showing the current state for each device. An example of the screen is shown below:



Uncheck each device which is to be inactivated. When finished, press the **Done** button to enact the change and hide the Active/Inactive column. The screen will return to the normal view.

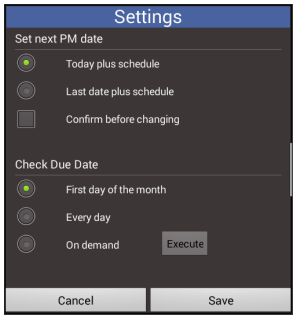
Change Inactive State

Select this option and touch **Save**. The display will now show ONLY the **inactive** entries, regardless of the state of the 'Hide' selection below. Individual inactive entries may now be changed back to Active. When finished, press the **Done** button to enact the change and hide the Active/Inactive column. The screen will return to the normal view.

Hide Inactive Entries

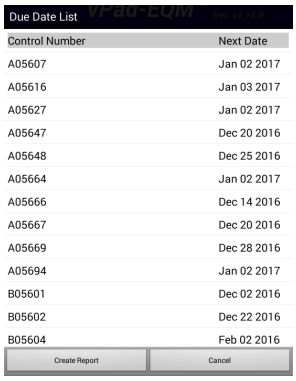
The above 2 options temporarily, cause the Active/inactive column to be shown so that device selection(s) can be made. The column is hidden when the Done button is pressed. This **Hide** option is 'sticky' and will remain in the last state selected when **Save** is pressed.

If **Hide** is selected, any devices which have been set to inactive will no longer appear in the device list. If **Hide** is de-selected, the inactive devices will return to the list.



Set Next PM Date:	Today plus schedule	The Next Date the device is due for PM will be calculated based on today's date plus the schedule of months indicated. This is considered to be a sliding schedule.
	Last Date plus schedule	The Next Date the device is due for PM will be calculated based on the Last Date plus the schedule of months indicated. This is considered to be a fixed schedule.
	Confirm before changing	The change will be displayed before saving the change to the device record.

Check Due Dates:	First day of the month	A list of devices that are due for PM will be displayed on the first day of the month that the app (EQM) is started.



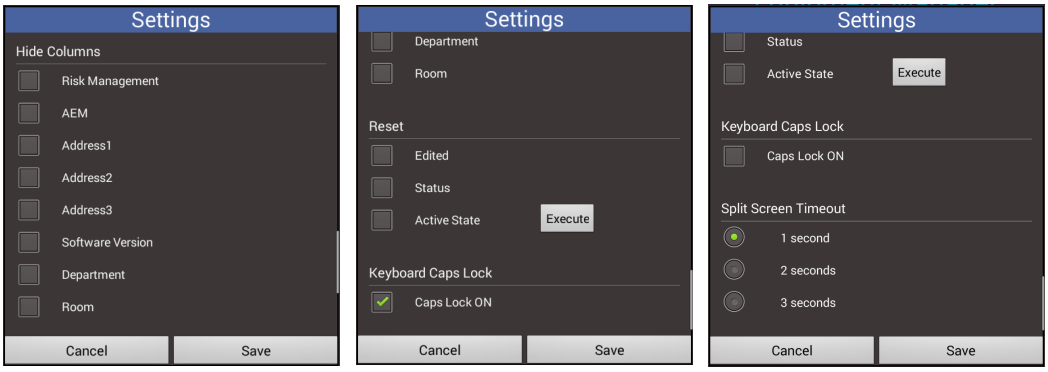
The list can be saved to a file 'Datrend\Database\EquipDueList.txt' for further review.

	Every day	A list of devices that are due for PM will be displayed whenever the app (EQM) is started.

The list can be saved to a file 'Datrend\Database\EquipDueList.txt' for further review.

	On Demand	A list of devices that are due for PM will be displayed whenever this setting is selected and 'executed'.

The list can be saved to a file 'Datrend\Database\EquipDueList.txt' for further review.



Hide Columns:	The listed columns (above) have been added to EQM, and may be hidden if they are not wanted/needed. Select each checkbox for the column that you would ***not*** like to display in the Equipment Manager screen. **Note:** If you do not want these particular columns, but want one with a different name, the names of all columns can be changed to meet ***your*** needs by editing the column name mapping file: Datrend\Database\EQMColumnsName.txt
Reset: (Edited, Status or Active)	Reset the flags (Edited, Status or Active) when Execute is pressed
Keyboard Caps Lock:	The keypad can be set to use caps only when entering information in fields. This does not apply to Comments fields.
Split Screen Timeout: 1, 2, or 3 sec	When scrolling the Equipment List, the Control Number and Description columns will be visible for this time setting

If the **Action** is set to **Edit/Create**, an edit icon,  , is shown to the left of the Settings icon. For **Action: Run**, the run icon,  is displayed.

4.2.1.3 Action Edit/Create Details

With the **Action** set to **Edit/Create**, touching a device row will display the **Equipment Manager** detailed information display for that particular device.

On the following screen, all of the basic information about the device which will be included in the test report is displayed. In the **Edit/Create** mode, it is possible to update information on a device and **Save** it. If you change the **Control Number** and **Save** it, a new record will be created with the new **Control Number** and all of the remaining fields will be copied, including

the **Serial Number**. If this was meant to be an edit of the **Control Number**, then the original record should be **Delete**d.

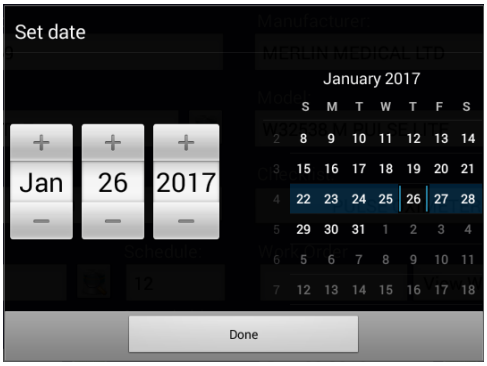
The basic equipment information is shown above. There are additional data fields available in the database which may or may not be hidden in the list view. These additional fields may be accessed by pressing the 'next page' icon,  . This will display the second page of data below.

It is possible to enter data into all of the fields. If the field has been set to 'hidden' in the

Settings, the indication (hidden) will appear after the field name. To return to the first page of data, press the 'last page' icon,  .

While on this screen you can also create a **New** record, **Copy** an existing record, or **Delete** the record on the screen.

New: This will clear all of the fields except the **Schedule**, which will contain the default setting of 12 months. Enter the information for the new device. Dates can be entered using the  icon which will present a date selection function as shown in the next figure. Use the + and - controls and/or the calendar page (which can be scrolled up and down) to select the date and then touch the **Done** button to accept the date. The date on the Details screen will automatically be formatted according to the **Date Format** setting.

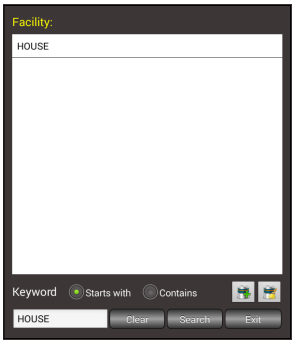


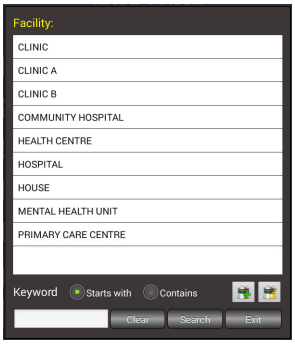
The **Checklist** can be selected from a list of the available Checklists while in the **Checklist** dropdown box. These checklists are the same as the ones available in vPad-Check.

Fields can be filled in manually by touching the field text box. This will cause a keyboard to appear, allowing text or numbers to be entered. If the field was pre-filled with a value on entering the screen, it may be necessary to delete some or all of the original data. If you make a change, don't forget to **Save** it.

Note: Some fields have a **Data List** icon,  , at the end of the text field box. This is an indication that the field can be filled from a list of values. These values will depend on the equipment list (or previous lists) that is currently available in the Equipment Manager. Touching this icon will show a screen similar to the following:

Each of the indicated fields has its own **Data List** . The current value of the field will be placed in the Search text box on entry to this form, and the existing **Data List** will be searched (using the 'Starts with' criteria). If it is not found, the list box will be empty, as indicated in the image above. If the value is found (or any others starting with the value in the search box), it/they will be displayed in the large white list box, as indicated in the image below on the left.

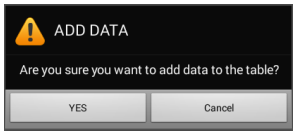




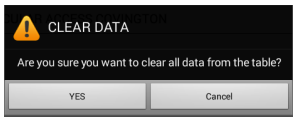
If you want to change the data to an entry from the available list, you need to display the list. To do this, press **Clear** and then **Search**. The available list will now be displayed as shown above on the right.

This list is created and updated manually. When **EQM** is run for the first time and an equipment list has been imported, the **Data List** will be empty. If the **Data List** is empty, or needs to be updated, use the  and/or  icons.

If your **Data List** needs to be populated for the first time, or needs to be updated in an 'additive' mode, use the  icon. You will be required to confirm this action with the following dialog.



If you want to remove all existing entries and then populate the list use  first and then  . You will be required to confirm clearing the database with the following dialog.



All of the entries in the equipment list, for the field of interest, will be scanned and a table of unique entries will be stored. This list will represent the 'standardized' list of selections for the particular field you are currently in. If the table of entries does not represent the current equipment list, the table can be added to by pressing the  icon. This will add any new entries from the current equipment list. If there are entries in the table that are no longer of interest, the table can first be cleared and then updated.

Schedule

The **Schedule** is the number of months between scheduled PM Inspections, and accepts any value equal to or greater than 0. The value 0 is a special case, indicating that the device has no schedule, and therefore there will be no **Next PM Date**.

Next PM Date

The **Next PM Date** is calculated automatically by adding the scheduled number of months to either the **Last PM Date** or today's date, depending on the **Setting**.

Work Order

If a **Work Order** exists for this Control Number, the Work Order number will appear here. If there is more than one work order, the first one will be shown. If no work order is available for this device, this field will be blank. In Edit mode, a work order number may be visible, but other Work Order controls are disabled.

When editing the information is completed, press the **Save** button and the **New** record will be inserted into the database. There will an Android 'toast' message which will appear at the bottom of the screen, which should read **"The record has been successfully created"**, or an alternate message if there was a problem.

When the record has been added, the vPad display will remain the same, allowing other actions to be performed with the information on the screen. When finished with all desired actions, press the **Exit** button to return to the equipment listing screen.

Copy: Pressing the **Copy** button will copy all of the fields, except **Control Number**, **Serial Number** and **Work Order**, to a 'new' device entry. This is particularly useful if you are creating multiple new entries for more than one similar/'identical' devices (eg. a shipment of 20 pulse oximeters). Enter the information for one device and then copy the core details using this **Copy** function. Be sure to **Save** the information after each device entry is completed.

This can also be helpful if you are creating a 'new' device entry which is virtual identical to another , existing device. For instance a new pulse oximeter: find a similar pulse oximeter using the **Search** feature, open an identical model and **Copy** the data. Make small changes, as necessary, then **Save** and **Exit**.

New: Pressing the **New** button will blank the data in all the fields. Enter new data for a device and press **Save**.

Delete: Pressing the **Delete** button will remove the displayed record from the equipment listing database. The information will remain on the screen in case it might be useful for a **New** or **Copy** function, or even to recover from an accidental deletion. When **Exit** is pressed, the deleted record will no longer appear in the equipment listing.

Save: **Save** will process each of the transactions (**New**, **Copy**, **Delete**, **Save**) that are performed. If **Save** is not pressed, the transaction will not be completed. For instance, if **Copy** is pressed and data is entered, then **New** is pressed; the **Copy** transaction will not be **Saved**. Save must be pressed after the **Copy** data is entered.

Exit: When **Exit** is pressed the user is returned to the equipment listing, which will reflect all of the changes made and **Saved**.

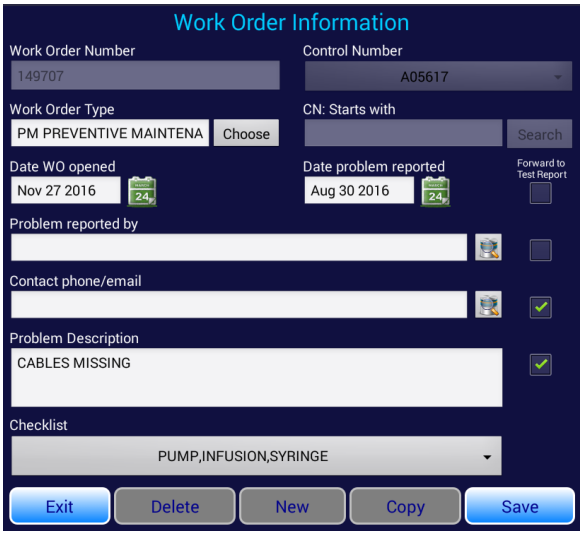
It is possible to have a **Next PM Date** which is in the past. This may be as the result of incorrect data entry or a data import from another source. When you complete a PM Work Order, this date will be corrected according to the **Schedule**. At the same time, the **Last PM Date** will be changed to reflect the date the **Work Order** was closed.

Whenever a device is created or edited, an internal "Edited" field is set to 1. This is used as a flag to indicate that this device record should be included in an **Equipment List Export**.

4.2.1.4 Action: Run

If the **Action** is set to **Run**, touching a device row will display the modified **Equipment Manager** information display for that particular device, as shown below. In this mode, the **Delete**, **New** and **Copy** buttons are disabled, and the **Save** button is re-named to **Run**. It is possible to change information in any of the fields except the **Control Number**. These changes will be reflected in the test report, but will not be automatically changed/saved in the database.

In this screen there may also be a **Work Order** number displayed. This is an indication that there is an open **Work Order** in the system for this device, and this work order and its associated Checklist (which will be shown on the screen) will take precedence when Run is pressed. Pressing the **View WO** button will display the **Work Order** screen shown in the next figure. If you do not wish to run this work order, it can be **disabled**, in which case the **Checklist** on the above display revert to the default **Checklist** for the device and will be used when Run is pressed. This **Checklist** may also be changed, if required. If you have accidentally disabled the work order on this screen, and wish to re-instate it, **Exit** the above screen and re-select the device.



If a **Work Order** number is not displayed, one may be created by pressing the **View WO** button. This will display a **Work Order** screen similar to that shown above. Whether a new **Work Order** is being created, or an existing one is being shown, the contents of the **Work Order** which are not 'grayed out' can be edited and saved, as required. If Auto-Numbering has been selected in the **Work Order Manager**, the **Work Order Number** will be automatically assigned, otherwise any number can be entered (see section 4.3.1.3 for additional information on Auto-Numbering). Any **Checklist** can be assigned to a **Work Order**.

Note: Some fields have a **Data List** icon,  , at the end of the text field box. This is an indication that the field can be filled from a list of values that have been previously used. See section 4.2.1.3 for more information on how the **Data List** work.

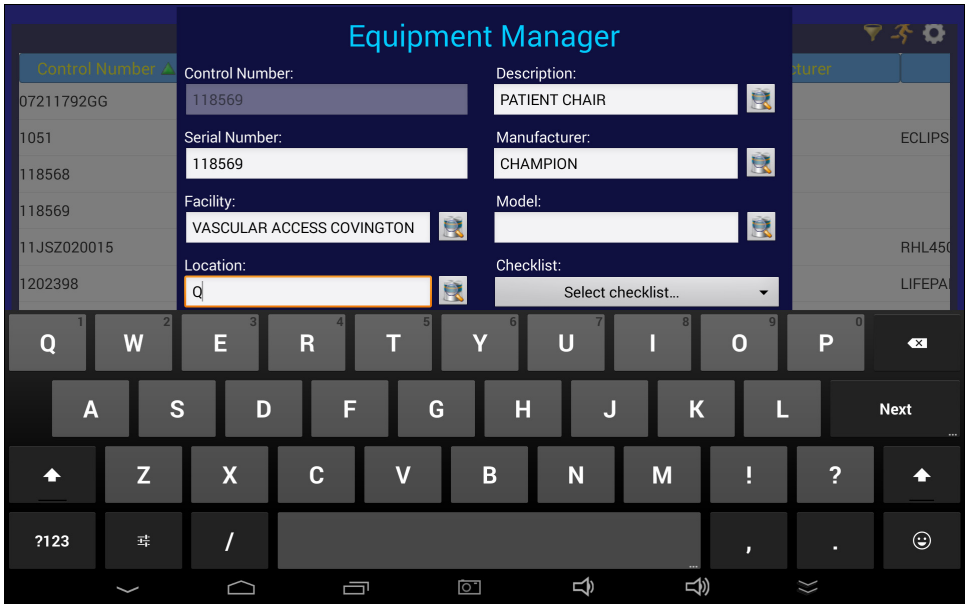
You can not Run directly from the WO screen when you have entered from the **Equipment Listing/Detail** screen. Press **Exit** or **Save** to go back to the **Details** screen and then **Run** to perform the **Checklist** test.

Note that it is possible to temporarily change the **Checklist** assigned in the **Work Order** or on the **Run** screen, making it possible to perform different tasks than the PM Procedure/ Checklist normally assigned to the device.

When the equipment data is correct and the **Run** button pressed, the assigned **Checklist** will be processed by the **vPad-Check** App. Entering the **vPad-Check** App and returning to **vPad-EQM** is transparent to the user. When the **Checklist** is completed, the **Work Order** is also completed, if one was assigned. When completed, the App returns to the Equipment Listing and updates the **Status** field with the result of the test (PASS or FAIL). **Status** represents the result of the last work done on the device.

4.2.1.5 Search

As previously mentioned under Section 4.2.1.1, it is possible to **Search** the equipment database by any of the parameters displayed on the screen. The currently selected column (parameter) is automatically selected as the **Search** parameter. To change the search context, select the column of interest.



While on the main **Equipment Manager** screen, touch in the **Search** text box. The column to be searched is indicated above the text box, and will change as different columns are selected. Once the text box is touched, a keyboard will appear to allow entry of the value for which to search. Before starting **Search**, select the search method: 1) **Starts with**; or, 2) **Contains**. Enter the search value and touch the **Search** button. In the **'Starts with'** mode, the **Equipment Manager** will show the closest (or exact) match in the list. This search is case sensitive.

In **'Contains'** mode, the **Equipment Manager** list will be filtered to contain only those devices which have the search value anywhere in the parameter of interest. This search is not case sensitive.

The last **Search** value will remain in the text box until changed by the keyboard or the **Clear** button is pressed. To return to the view of the complete equipment list, press **Clear** and then **Search**.

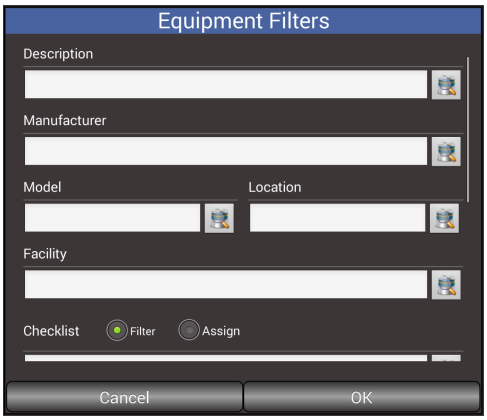
4.2.1.6 Filter

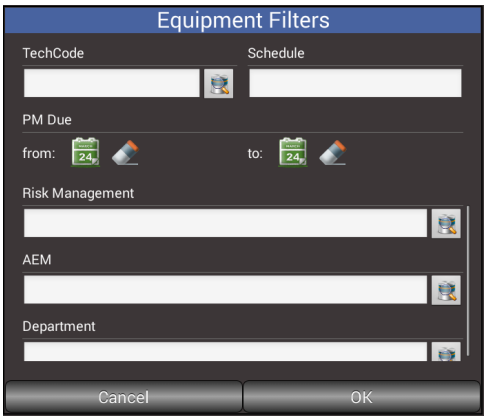
Equipment may be filtered by the following parameters:

- Description
- Manufacturer
- Model
- Location
- Facility
- Checklist
- Techcode
- Schedule
- Risk Management
- AEM
- Department
- PM Due date range

With the exception of the PM Due date range, values for the parameters can be selected from a list accessed by pressing the **Data List** icon, , at the end of the text field box. This is an additive filter, with each additional filter parameter narrowing the resulting list further. With the filter set, only the devices which meet the filter criteria will be visible on the screen.

Note that the Checklist **Data List** is created dynamically each time it is selected, and may take several seconds to complete the list.

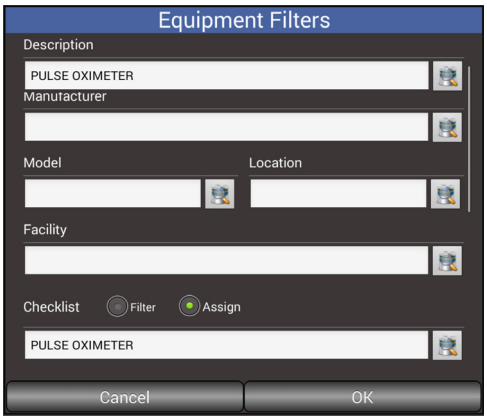




While the data is filtered, the File I/O function will allow the filtered list to be exported.

To reset the display list to 'all', press on the filter icon, , and then **'OK'** (without setting any parameter filters).

Note: A selected Checklist may be assigned to a filtered equipment data set. Select the appropriate set of filters (eg. Description = Defibrillator; Manufacturer = Zoll). Change the radio button adjacent to the Checklist field to **'Assign'** and select a Checklist from the **Data List**. Press Okay to complete the assignment of the selected Checklist to the filtered data set.



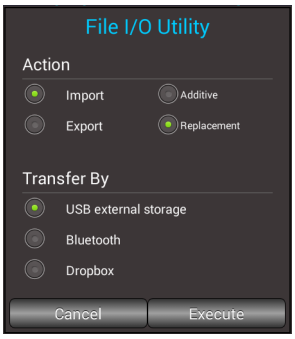
4.2.1.7 File I/O

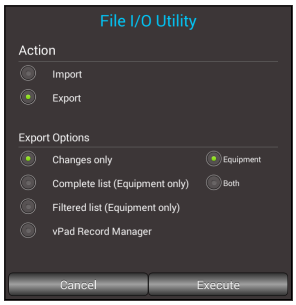
The Equipment List is stored in a SQL database on the tablet. This database may be generated on-line as equipment is encountered, but it also may be imported from another source such as an asset management system, or a home grown equipment tracking system. Once the equipment data exists on the tablet, it may be changed as the equipment is serviced and errors are corrected. The modified database may be exported to a PC to update the existing programs on the PC.

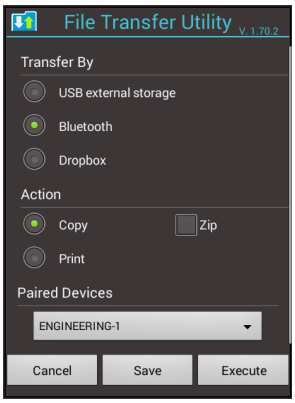
File movement is facilitated with the File I/O Utility. The file format for transfer in the ***output*** direction is the CSV file. The exported 'equipment.csv' file contains all of the fields identified in Section 4.2.1, plus a field called "Edited". This field indicates if a particular device record has been changed since the last import. The equipment list also contains a "Status" field. This field indicates the result of the last test performed since the last data export. These two fields are flags to the file export function, indicating a change in data since the last export. When exporting data, it may be: 1) only the data that has changed since the last export; 2) all of the data in the equipment list; or, 3) all of the data that is filtered and is currently in the displayed equipment list. When the equipment list is exported with option 1, the "Edited" field and the "Status" field are cleared.

An imported equipment file does not need to contain these fields, but if it does, the "Status" field should be blank, and the "Edited" field should contain 0's. Another field that is controlled by the import from the PC is the "ActiveState" field. Devices may be set to an 'Inactive State' either during the import process, or selectively during use of the EQM app. The ***import*** file is named CMX.TXT, which can contain both the 'equipment.csv' file and

the 'workorderinfo.csv' file. This CMX.TXT file is created by the CMX program on the PC.







Files can be imported in an **Additive** or **Replacement** mode. In **Additive** mode, new devices can be Imported and added to the existing list on the tablet; and, existing devices with edited data (from the PC based system) can be Imported and effectively modify the data on the tablet for specified devices. This reduces the time in processing the equipment or work order CSV files into the SQL database. In **Replacement** mode, the existing equipment list is replaced with the equipment list being imported. This is intended for importing equipment lists from different facilities or customers, where the existing list would have no purpose. In other cases, you may only be interested in having a short list of equipment on the tablet for "today's" testing. In this case, replacement is the best option.

It may be desirable to **Import** equipment or work order files that updates information on individual devices or work orders on the tablet. If the **Import Additive** function encounters a duplicate record on the tablet, the user will be given the option to update **'this instance'**, **'all instances'**, or **'skip'** the update of this one record.

The transfer of files can be done via a USB drive, through Bluetooth transfer, or via Dropbox. Be sure the USB drive is connected before you try to transfer the file, if you are using USB. If you select Bluetooth transfer, make sure the PC you are going to talk to has Bluetooth capability and has been paired with the tablet. For Dropbox, ensure that it is installed and linked on both the PC and the tablet before proceeding, and a Test Reports folder exists.

When Exporting files from the **Equipment Manager** screen, first select whether you wish to export the **changed equipment** (and **workorderinfo**) files, the complete equipment list, the filtered equipment list, or the test reports (via vPad-RM{Record Manager}) that have not previously been copied to an external device or SD card archive. Once selected, touch the Execute button. Once you have selected the file set to trransfer, you will be presented with the options for transfer. If using bluetooth, be sure the PC is paired to the tablet and the correct Paired Device is selected. If you have changed the Paired Device and/or the method of transfer and wish this to be the default setting, touch the **Save** button before **Executing**

the transfer.

When using bluetooth, the file will be transferred to the PC and stored in a default file folder, normally in:

C:\Documents and Settings\<your name>\My Documents\Bluetooth Exchange Folder

The name of the Bluetooth folder is OS version dependant. Check your PC Bluetooth setting to confirm the location.

When importing a file into EQM, the CMX.TXT file must exist in the tablet's bluetooth folder, in the root of the USB drive, or in the Dropbox\Datrend Imports folder. If you are using **CMX** to send the CMX.TXT file to the Bluetooth or Dropbox folder, be sure to delete any existing CMX.TXT files in the folder, otherwise the 'new' file may automatically be renamed CMX-1.TXT, and the import function will use the wrong (old) file. For information on the **CMX** program for the PC, please refer to the manual: **MN-083 6100-048 CMX Operators Manual**.

Note: The **Edited**, **Status** and **ActiveState** fields are not modified during the **Export** process.

The format of the CMX file is important in order to correctly import into EQM. The basic format is as follows:

```
}WORKORDERINFO.CSV{
"WorkOrder","ControlNumber","Description","Open_Date","Closed_Date","Report_Filename","Status","TechCode","WOType","ReportedDate","ReportedBy","ContactInfo","Checklist",
"PassDateReported","PassProblemBy","PassContactInfo","PassProblemDesc"
"151814","A05688","BROKEN!","2016-08-30","2016-08-30","","","JR","PM","2016-08-30","UNKNOWN","","PULSE OXIMETER","1","0","0","1"
"151889","A05691","PM REQUIRED","2016-08-30","2016-08-30","","","JR","PM","2016-08-30","MARY RN","X567","PULSE OXIMETER","1","1","1","1"
}EQUIPMENT.CSV{
ControlNumber","Description","SerialNumber","Manufacturer","Model","Location","Facility","Checklist","TechCode","Schedule","LastDate","NextDate","Status","RiskManagement","AEM",
"Address1","Address2","Address3","SoftwareVersion","Department","Room","Edited","ActiveState
"A05607","OTOCLEAN SYSTEM","12291","MIRAGE HEALTH GROUP LTD","PROPULSE II","WARD 1","HOSPITAL","Monitor,NIBP (full
test)","95223","6","10/28/16","12/02/17","FAIL","Class1","No","130 4020 Viking Way","Richmond","rnd@datrend.com","1.01.54b","ICU","3","0","1
"A05626","NIBP NON INVASIVE BLOOD PRESSURE MONITOR","20131000194VG","OMRON HEALTHCARE","M6","CONSULTING ROOM 9","HEALTH CENTRE","Demo
Checklist","147594","10","11/28/16","12/02/17","","Class4","AEM#623","130 4020 Viking Way","Richmond","rnd@datrend.com","1.01.54b","ICU","3","0","1
```

Key points are that the equipment information is preceded by the header "}EQUIPMENT.CSV{", followed by the column names row, then the actual data. Similarly, the work order information is preceded by the header "}WORKORDERINFO.CSV{", followed by the column names row, then the actual data. The work order information may be second or first in the CMX file. In the example shown above, the column names row and some of the data rows take up 2 lines due to their length.

Clearing or modifying these fields on the tablet database is done during the **Import** process. These fields are intended as flags to a PC based program. If a file is **Imported** as a replacement for the existing file, the previous contents of these fields on the tablet is not relevant. However, during an **Additive Import**, only new or revised device/work order records are imported.

The intent is that the user will used the data exported from vPad-EQM to update/revise records on the PC based CMMS system. The CMMS system would, in returning data to vPad-EQM,

clear the **Status** field, and reset the **Edited** field to '0'. In addition, any devices that have been set to **Inactive** would have their data record sent. The CMMS system is responsible to send back any revisions it has made to data it has received from the tablet, in order to sync the tablet data with the CMMS.

Note: Caution should be exercised when **Importing** an Equipment.CSV file from a PC where Excel was used to create the file. Specifically, serial numbers which are all long and numeric may be changed by Excel to an exponential format automatically, and may not be converted to a CSV format correctly (ie. 1234567891234 may become 1.2E+12). Correct data transfer may be achieved by formatting the serial number column to 'number, decimal places=0' before creating the CSV file format. Failure to do this may result in serial numbers being saved as the wrong text data (ie. 1.2E+12), which may be non-recoverable.

4.2.2 Work Order List

The **Work Order List** can be accessed by touching the **Work Order List** button. The capabilities of the **Work Order List** are discussed in Section 4.3.1 following.

4.2.3 Exit vPad-EQM

The **Exit vPad-EQM** button returns to the **Home** screen of the Android tablet.

4.3 Work Order Manager

The **Work Order Manager** is accessed from the **Equipment Manager** screen, by touching the **Work Order List** button. The **Work Order Manager** begins in the **Work Order List** screen, as shown below.

4.3.1 Work Order List

The work order database or **Work Order List** contains 12 parameters* which are displayed on the screen in a vertical/horizontal list box, and 5 parameters that are retained internally for control purposes. The parameters/database fields are:

"WorkOrder"	*This is a unique entry, identifying the work or job
"ControlNumber"	*This is the unique ID of the device to be tested
"Description"	*The description of the problem to be corrected
"Open_Date"	*The date the WO was opened
"Closed_Date"	*The date the WO was closed
"Report_Filename"	*The filename of the test report
"Status"	*Typically PASS or FAIL
"TechCode"	*As in the Equipment list above
"WOType"	*User defined in a text file list WorkType.txt, in Datrend\Database folder
"ReportedDate"	*Normally the same as Open_Date
"ReportedBy"	*Person reporting the problem
"ContactInfo"	*How/where to contact the person above
"Checklist"	The name of the Checklist to follow
"PassDateReported"	A flag indicating that the ReportedDate data should be included in the test report
"PassProblemBy"	A flag indicating that the ReportedBy data should be included in the test

	report
"PassContactInfo"	A flag indicating that the ContactInfo data should be included in the test report
"PassProblemDesc"	A flag indicating that the (Problem)Description should be included in the test report
"Exported"	A flag indicating that the Work Order has been exported to an external device

4.3.1.1 Scrolling

The parameters are displayed in columns on the screen, in the order listed previously. Since all the columns can not fit on the screen at once, other columns can be made visible by scrolling the list view horizontally using a swipe motion (left to right, or right to left) until the parameter of interest is available.

In the list view, each row represents one work order. Additional work orders can be displayed by using an up or down swipe motion to scroll through all of the available work orders. If there are a lot of work orders in your database, it may be faster to use the **Search** feature to find or get close to the work order of interest.

Each of the columns has a name, shown in the title bar of the list view. Touching the name in the title bar will select that column for sorting. A sort direction icon will appear beside the name of the column, ▲ for ascending (start at 'a' or '0') or ▼ for descending (start at 'z' or '9'). Selecting a column name will also select that column as the **Search** parameter.

Columns in the **Work Order Manager** can not be re-named.

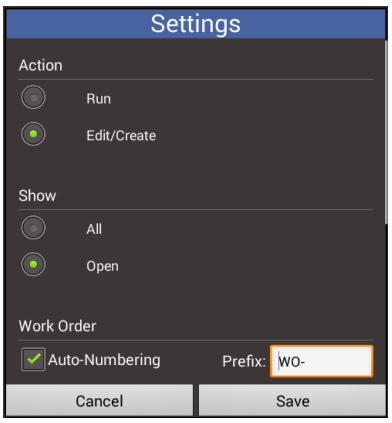
4.3.1.2 Settings

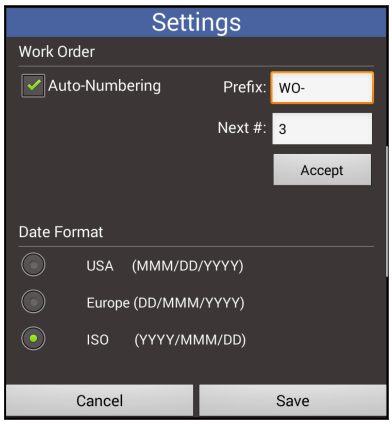
While in the **Work Order Manager**, there are certain **Settings** that control some aspects of the displayed information or what will happen when a device row is touched. The settings icon,  , is at the upper right corner of the display. Under **Settings** you can set the following:

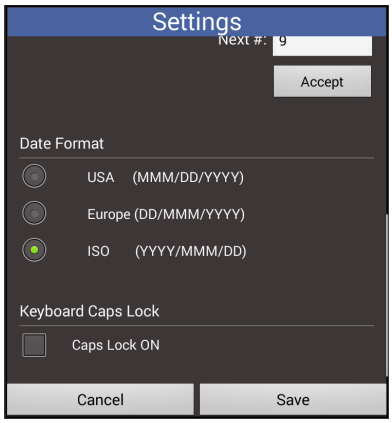
Action:	Run or Edit/Create	See details below
Show:	All or Open (work orders)	If showing All work orders, the closed work orders will appear in light brown text 
Work Order:	Auto-Numbering/Prefix	Work Orders can be numbered

automatically in sequential order, with the assigned prefix

Date Format:	USA (mmm/dd/yyyy) Europe (dd/mmm/yyyy) ISO (yyyy/mmm/dd)	
KeyboardCaps Lock:	On/Off	Force the keyboard into capital letter format for most data entry







As with Settings under Equipment Manager, the Date Format may be selected/changed by scrolling down in this window.

If the Action is set to **Edit/Create**, an edit icon,  , is shown to the left of the **Settings** icon. For **Action: Run**, the run icon,  is displayed.

4.3.1.3 Action: Edit/Create Details

With the **Action** set to **Edit/Create**, touching a work order row will display the **Work Order Information** detail display for that particular work order.

On this screen, all of the information about the work order is displayed. In the **Edit/Create** mode, it is possible to update information on a work order and **Save** it. If you change the **Work Order Number** and **Save** it, a new record will be created with the new **Work Order Number** and all of the remaining fields will be copied. If this was meant to be an edit of the **Work Order Number**, then the original record should be **Deleted**.

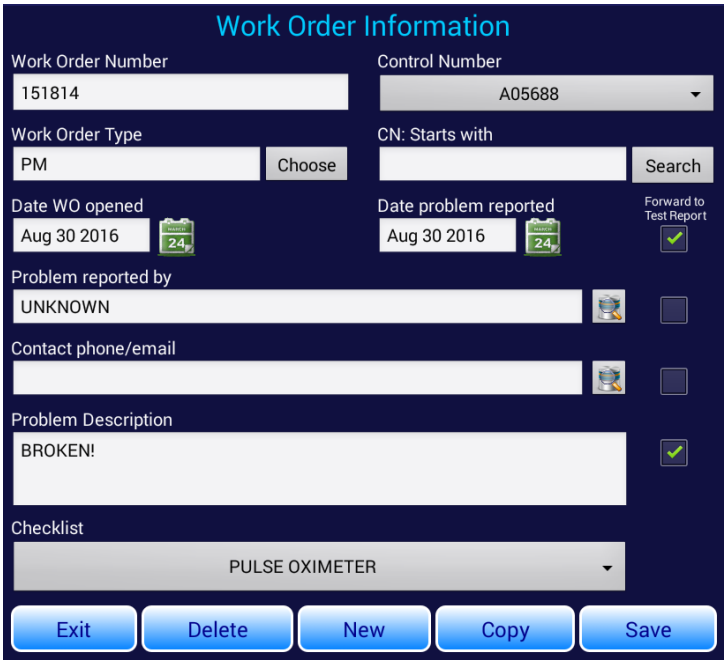
Note: Some fields have a **Data List** icon,  , at the end of the text field box. This is an indication that the field can be filled from a list of values that have been previously used.

If data is typed into this field it will be saved to the data list automatically.m See section 4.2.1.3 for more information on how the **Data List** work.

Note: Some fields have a checkbox on the right side of the screen. To include this field in the test report check the box.

Note: A different Checklist may be selected on a work order, allowing for specialty services to be performed. These specialty services must have a Checklist created and installed on the tablet in advance. An example of this might be a **O2 Monitor Battery Replacement** , or, **Cable Replacement**, or **Telemetry Adjustment**.

While on this screen you can also create a **New** record, **Copy** an existing record, or **Delete** the record on the screen.



New: This will clear all of the fields except the **Date**, which defaults to today's date. Enter the information for the work order. Dates can be entered using the  icon which will present a date selection function as described previously. Use the + and - controls to select the date and then touch the **Done** button to accept the date.

The **Work Order Number** can be generated automatically or entered manually, depending on the **Settings**. If it is generated automatically, it will number sequentially using the **WO Prefix** and the **Next #** as indicated in the **Settings**.

Note: When using the Auto-Numbering system, you can reset the counter to a number lower than what you currently have as the 'next number'. In this case, any work orders generated by the Auto-Numbering system which are greater than the new number will be deleted (a cautionary prompt will be displayed first). Any work order numbers generated manually which are in the ***same*** format as the Auto-Numbered format will ***not*** be recognized, and therefore will ***not*** be deleted.

The **Control Number** may not be known at the time the **Work Order** is created. The **Work Order** may be created as the result of a message or phone call from an individual that does not know the **Control Number**. If the **Control Number** is not known, use the default **'Unknown Control Number'** entry. If the **Control Number** is known, the drop down list will allow selection of the correct number. To get closer to the number in the list, use the **Search** feature **'CN: Starts with'**. Enter the first few numbers/characters of the **Control Number** and touch **Search**. The drop down list will begin at this value.

When completed, press the **Save** button and the **New** record will be inserted into the database. There will an Android 'toast' message which will appear at the bottom of the screen, which should read **"The record has been successfully created"**, or an alternate message if there was a problem. When the record has been added, the vPad display will remain the same, allowing other actions to be performed with the information on the screen. When finished with all desired actions, press the **Exit** button to return to the work order listing screen.

Copy: Pressing the **Copy** button will copy all of the fields, except **Work Order Number**, to a 'new' work order entry. This is particularly useful if you are creating multiple new entries for more than one similar/'identical' devices (eg. a shipment of 20 pulse oximeters). Enter the information for one device and then copy the core details using this **Copy** function, then update the **Control Number** and **Serial Number**. Be sure to **Save** the information after each device entry is completed.

This can also be helpful if you are creating a 'new' work order entry which is virtual identical to another , existing work order. For instance a new pulse oximeter: find a similar pulse oximeter using the **Search** feature, open an identical device's work order and Copy the data. Make any small changes, as necessary, then **Save** and **Exit**.

Delete: Pressing the **Delete** button will remove the displayed work order from the work order listing database. The information will remain on the screen in case it might be useful for a **New** or **Copy** function, or even to recover from an accidental deletion. When **Exit** is pressed, the deleted record will no longer appear in the work order listing.

Save: **Save** will process each of the transactions (**New**, **Copy**, **Delete**, **Save**) that are performed. If **Save** is not pressed, the transaction will **not** be completed. For instance, if **Copy** is pressed and data is entered, then **New** is pressed; the **Copy** transaction will not be **Saved**. Save must be pressed after the **Copy** data is entered.

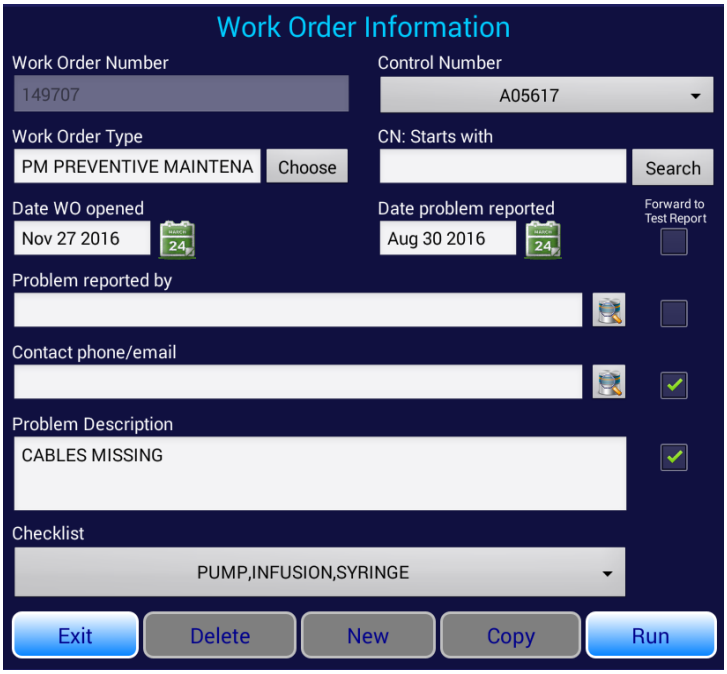
Exit: When **Exit** is pressed the user is returned to the work order listing, which will reflect all of the changes made.

4.3.1.4 Action: Run

If the **Action** is set to **Run**, touching a work order row will display the modified **Work Order Information** detailed display for that particular work order, as shown below. In this mode, the **Delete**, **New** and **Copy** buttons are disabled, and the **Save** button is re-named to **Run**. It is possible to change information in any of the fields except the **Work Order Number**.

In this screen there may also be a **Control Number** displayed. If the display indicates **Unknown Control Number**, or the **Control Number** is incorrect, it can be changed at this time. Specific control numbers may be located by use of **'Control Number: Starts with'**. Simply type in the beginning of the control number and touch **Search**. The drop down list will then begin at the value just input, which should be close to the full control number.

Press Run to proceed to the **Equipment Manager Detail Information** screen and if the equipment information is correct, press **Run** again to complete the **Checklist**. Be sure a **Checklist** has been selected or you will simply return to the **Equipment Manager Detail Information** screen.

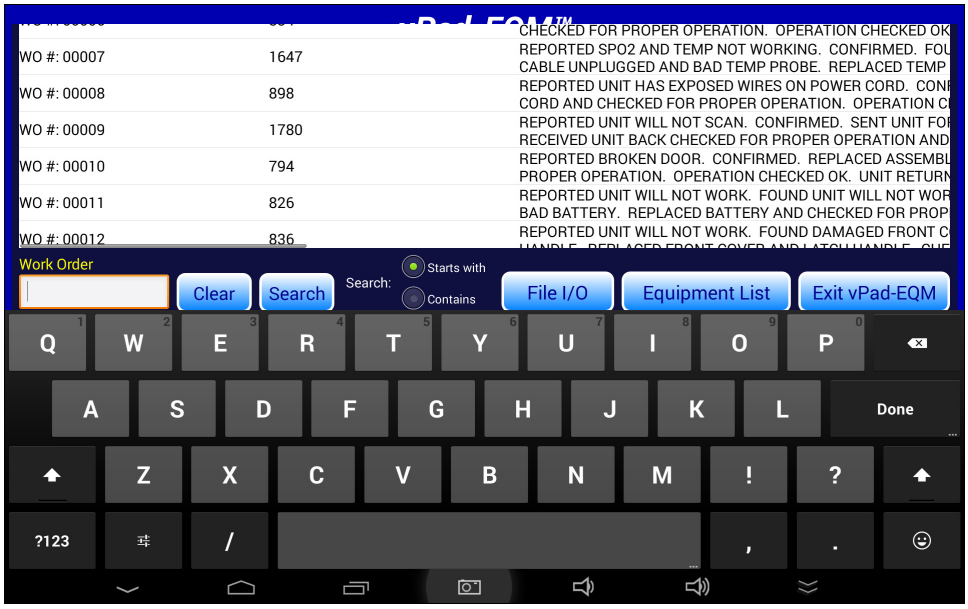


When a **Work Order** is **Run** and completed, the **Work Order** database will be updated: 1) the **Date Closed** will be entered; 2) the **Report Filename** will be entered; 3) the **Status** (Pass/Fail) will be entered, and 4) the **Tech** who performed the service will be entered. The **Status** in the

Equipment database will also be updated.

4.3.1.5 Search

As previously mentioned under Section 4.3.1.1, it is possible to **Search** the **Work Order** database by any of the parameters displayed on the screen. The currently selected column (parameter) is automatically selected as the **Search** parameter. To change the search context, select the column of interest.



While on the main **Work Order List** screen, touch in the **Search** text box. The column to be searched is indicated above the text box, and will change as different columns are selected. Once the text box is touched, a keyboard will appear to allow entry of the value for which to search. Before starting **Search**, select the search method: 1) **Starts with**; or, 2) **Contains**. Enter the search value and touch the **Search** button. In the **'Starts with'** mode, the **Work Order List** will show the closest (or exact) match in the list. This search ***is case sensitive***. In **'Contains'** mode, the **Work Order List** will be trimmed to contain any devices which have the search value anywhere in the parameter of interest. This search is ***not case sensitive***. To return to a full listing, clear the search input box and search again.

Searching the Work Order List could be beneficial if the Work Order List is long, and the Control Number is known or you are looking for work orders in a specific Open Date range, like April. Note that the work order that most closely matches the search value is highlighted in green lettering.

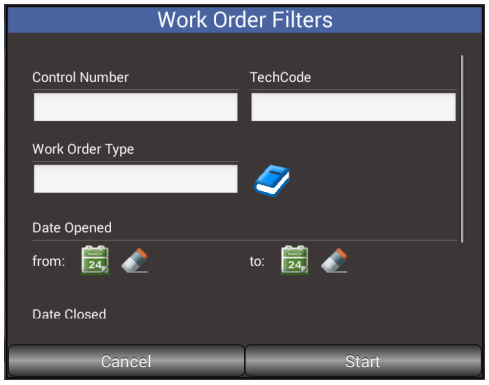
The last **Search** value will remain in the text box until changed by the keyboard or the **Clear** button is pressed. To return to the view of the complete equipment list, press **Clear** and then **Search**.

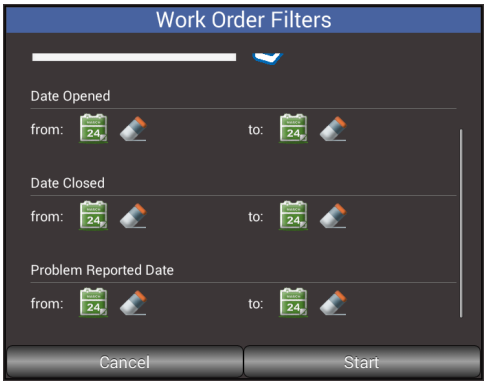
4.3.1.6 Filter

Equipment may be filtered by the following parameters:

- Control Number
- TechCode
- Work Order Type
- Date Opened
- Date Closed
- Problem Reported Date

With the exception of the PM Due date range, values for the parameters can be selected from a list accessed by pressing the **Data List** icon, , at the end of the text field box. This is an additive filter, with each additional filter parameter narrowing the resulting list further. With the filter set, only the devices which meet the filter criteria will be visible on the screen.





While the data is filtered, the File I/O function will allow the filtered list to be exported.

To reset the display list to 'all', press on the filter icon,  , and then **'OK'** (without setting any parameter filters).

4.3.1.7 File I/O

The **Work Order List** is stored in a SQL database on the tablet. This database may be generated on-line as work orders are required, but it also may be imported from another source such as an asset management system, or a home grown equipment tracking system. Once the work order data exists on the tablet, it will be changed as the equipment is serviced and work orders are completed. The modified database may be exported to a PC to update the existing programs on the PC.

When Exporting files from the **Work Order Manager** screen, first select whether you wish to export the **changed work orders** and **equipment** files, the complete work order list, the filtered work order list, or the test reports (via vPad-RM{Record Manager}) that have not previously been copied to an external device or SD card archive. Once selected, touch the Execute button. If you have selected to export the **equipment** and **work order** files, you will be presented with the options for transfer. If using bluetooth, be sure the PC is paired to the tablet and the correct Paired Device is selected. If you have changed the Paired Device and/or the method of transfer and wish this to be the default setting, touch the **Save** button before **Executing** the transfer.

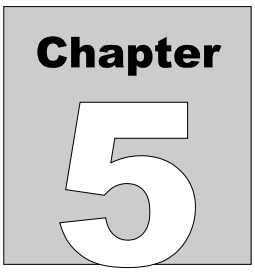
See section **4.2.1.7** in the **Equipment Manager** section for a additional detail on how the **File I/O** function works.

4.3.2 Equipment List

The **Equipment List** can be accessed by touching the **Equipment List** button. The capabilities of the **Equipment List** are discussed in Section 4.2.1.

4.3.3 Exit vPad-EQM

The **Exit vPad-EQM** button returns to the **Home** screen of the Android tablet.



5 Upgrades and Maintenance

Software Applications (Apps) may from time-to-time be upgraded to provide enhanced features or improvements. Contact Datrend or your local dealer for information on these upgrades.

In some cases, the changes made to an App may be to correct operational issues that have come to the attention of DSI. These shall generally be referred to as maintenance upgrades. In other cases, the changes may be to improve performance or add features which would enhance the overall functionality of the App. The decision to apply a charge to any upgrade shall be solely at the discretion of DSI.

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