WellPilot RPOC Data Manager

User Manual

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Manual Version	A
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Preface

Record of Revisions

Version	Author(s)	Description	Date
A	J. Johnston	Initial Release software Version 1.00.08	May 2014

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Data Conventions

In certain instances, this manual sets specific information aside from the normal format of the text. This is done to attract the attention of the reader. Several standard conventions are used in the procedures throughout this manual. These conventions are described as follows.

Note Statements

Notes are used to indicate useful information that a user may need to know to complete the task he/she is working on. Additionally, notes are used to highlight information that will benefit the reader. They are shown throughout the manual using the following format.

A note highlights information that will benefit the reader.

Caution Statements

A Caution statement indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. Caution statements are shown throughout the document in the following format.

A caution denotes conditions under which lack of care or attention to instructions could result in damage to equipment.

Warning Statements

A Warning statement is used to notify the user of a situation that could result in injury or death.

A WARNING TELLS OF A SITUATION IN WHICH LACK OF CARE OR ATTENTION TO INSTRUCTIONS COULD RESULT IN INJURY OR DEATH TO PERSONNEL.

Overview

Introduction

The WellPilot RPOC Data Manager (RDM) is a stand-alone software that communicates directly with a Rod Pump Optimization Controller (RPOC). RDM has the ability to upload and download parameter values to the RPOC. This document defines how to use the WellPilot RPOC Data Manager software.

RDM utilizes projects to send and retrieve basic setups to/from the RPOC as well as to display, save, and restore the status and setup. The file extension for a project is .xml. All projects are paired with a range of firmware versions. If the firmware on the RPOC has been upgraded, a new factory default project may be required for some features of the RDM to function properly. Modify the default project as needed or connect and retrieve the setup from an RPOC to “auto-configure” a default project.

Purpose and Scope

Some features detailed in this manual may not be available depending on the project and hardware installed. Projects can be custom designed to meet the needs of Weatherford customers. The tabs, parameters, and examples in this manual may not match every project. They are to define the basic functionality of the RDM.

System Requirements

The RPOC requires the following software and hardware:

- Any computer capable of running Windows XP or Windows 7 (32 & 64 bit) operating systems
- A serial (RS-232) port or Ethernet port
- Hard drive space of 11[MB]
- Memory, 90[MB] of RAM

NOTE

.NET Framework 4 Client Profile must also be installed on the PC (RDM installation will prompt the user to install .NET before continuing).

Product Usage

This software can be used to configure and monitor the following RPOCs made by Weatherford:

- FW-00004-00 WellPilot RPOC (v3.03.15 or later).

Installation and Setup

The first step is to install the WellPilot RPOC Data Manager software. After starting the program, existing projects can be opened. A factory default project is provided with the installation. The default project is created for the latest production release of the RPOC at the time that this software is compiled and may not work fully with previous or future firmware releases. The final step is to establish communication between the program and the RPOCs.

Installation Instructions

To begin installing the software, follow the steps below:

1. Copy the "InstallDataManager.msi" setup file to your computer.
2. Double click on the file to launch the Setup Wizard.
3. When the Wizard's Welcome screen appears, select Next > to begin installing the software.

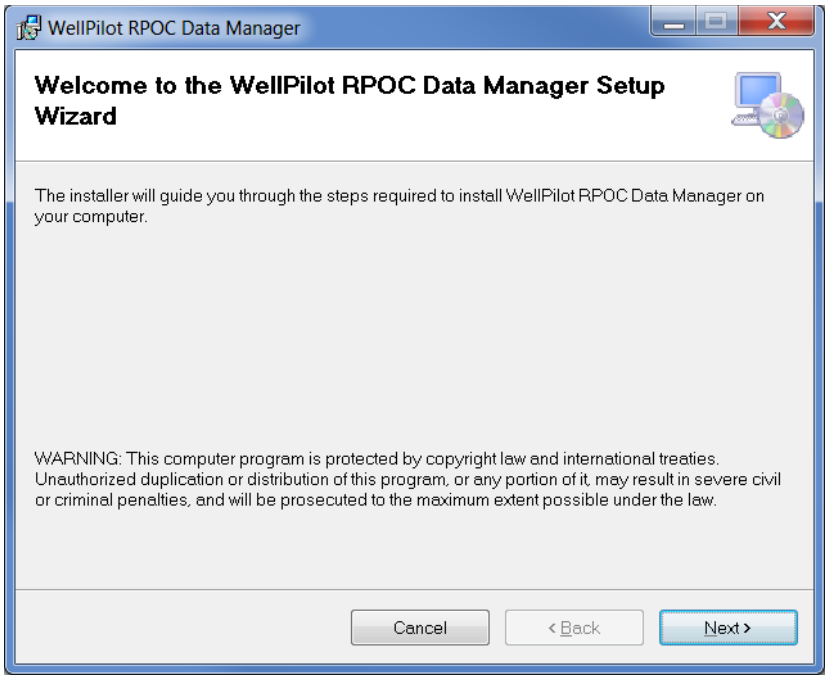

Figure 1: Setup Screen

4. You may accept all the defaults (recommended) or customize your installation.

5. The Installation Folder screen appears next. It allows the user to select the folder (directory) location of the software. Also select to install RDM only for the current user (default) or for everyone.

   If the directory structure is acceptable, click Next > .

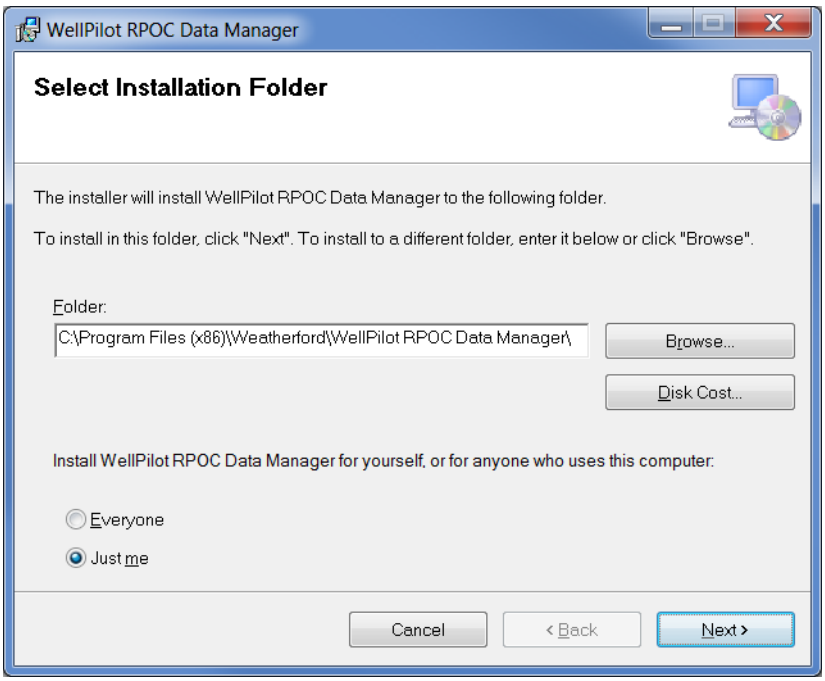

Figure 2: Installation Screen

NOTE

The factory default project included with the installation is only installed on the user's directory. If the "Everyone" option is selected, other users will have to add the default project manually or use an existing project.

6. If another directory is desired, click Browse... to open the "Browse for Folder" window, browse then click OK .

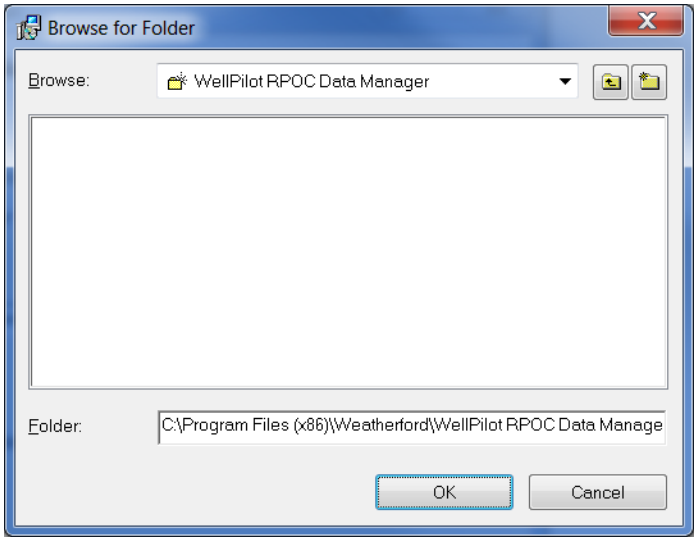

Figure 3: Browse for Folder Window

7. The next screen is the Confirm Installation screen. Click Next > to begin installing RDM.

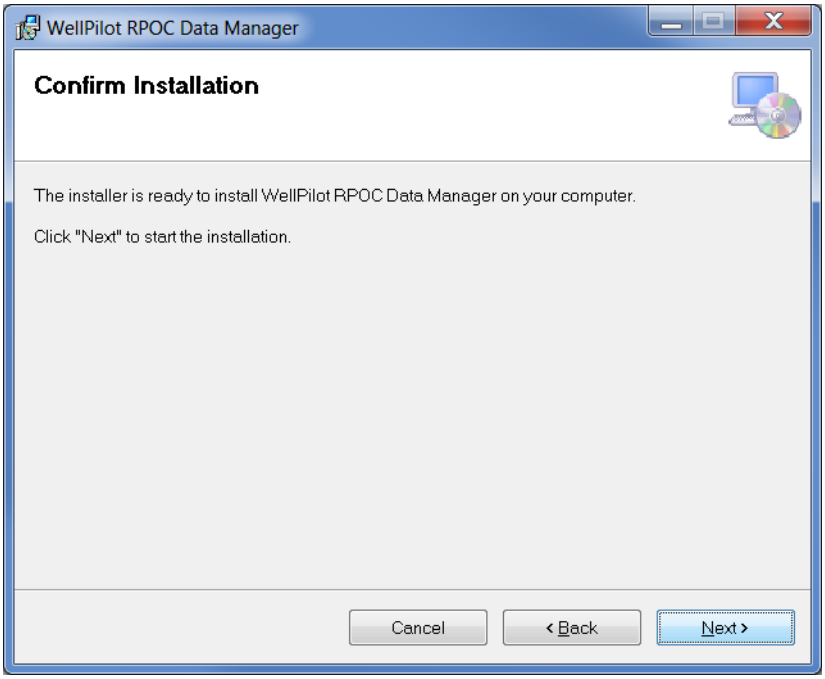

Figure 4: Confirm Installation Screen

NOTE

A User Account Control window may appear asking the user to allow the RDM installer to make changes to the computer. Click [Yes] to continue.

8. The installation process automatically executes until the final screen appears

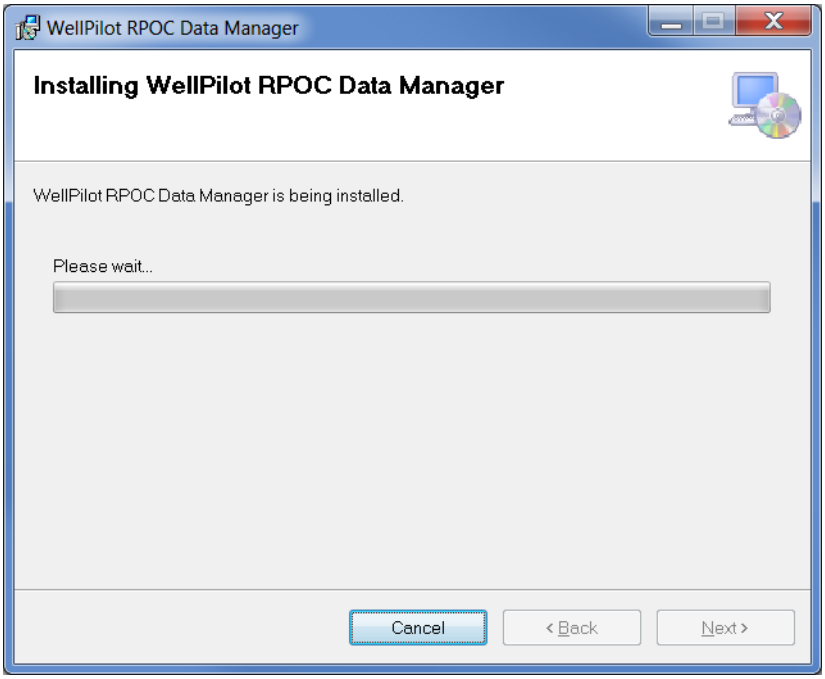

Figure 5: Installation Progress Screen

9. On the final screen the words “Installation Complete” are shown. Select Close on this screen to complete the installation process.

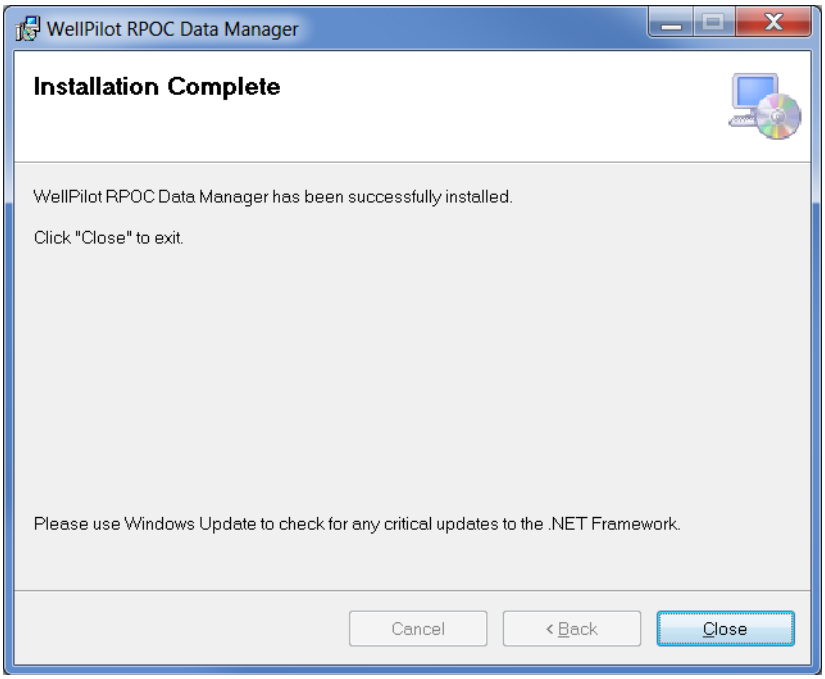

Figure 6: Installation Complete Screen

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Touring the Software

Starting WellPilot RPOC Data Manager

RDM can be opened using one of the following options:

1. Via the Start menu by selecting Start → All Programs → Weatherford → WellPilot RPOC Data Manager → RPOC Data Manager.
2. Double click on the RDM icon that was installed on the Desktop (if option was checked during installation).
3. Click on the RDM icon that was installed on the Quick Start bar (if option was checked during installation).

Main Window

In the RDM main window is the Title Bar, Ribbon, Content area, Status bar, and Tabs. When this screen is less than the maximum size, it can be moved to a new position on the desktop by clicking on the Title bar and dragging it to the desired location. The height and width can be changed by clicking and dragging the borders or by using the resize handle in the lower-right corner.

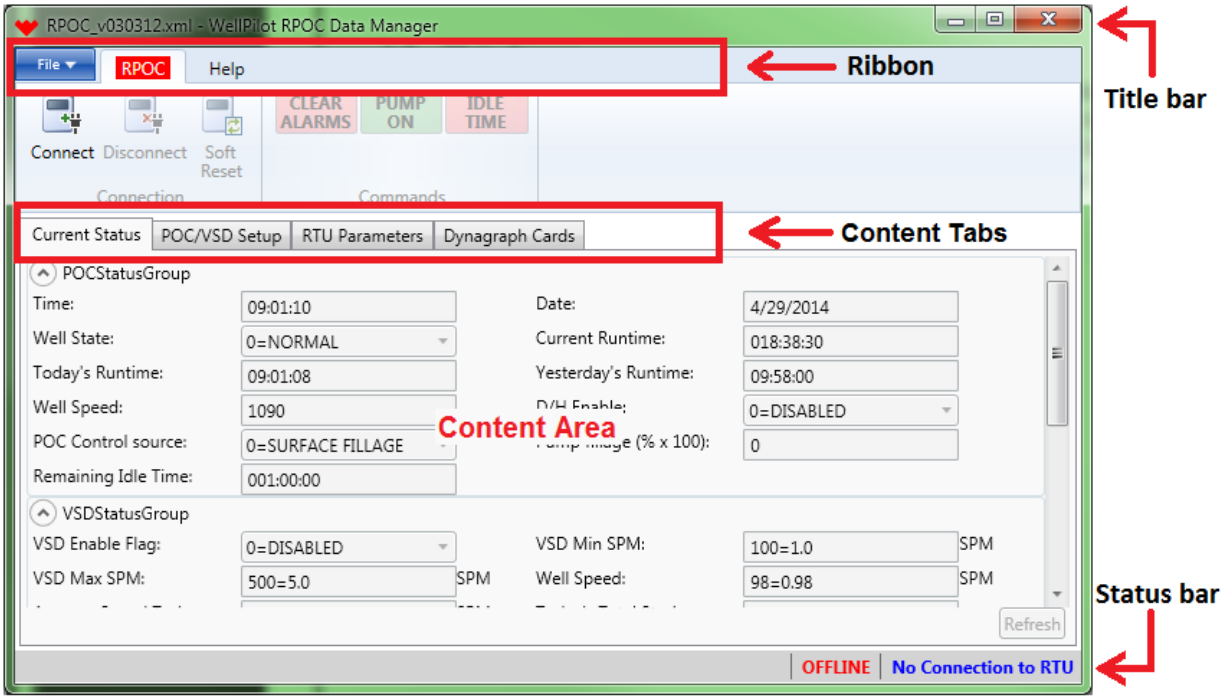


Figure 7: Main Window Descriptions

Title Bar

The Title bar displays the program name as well as the name of the project currently opened. It also has buttons that can be used to manipulate the window

Ribbon

The Ribbon provides multiple tabs each containing buttons grouped according to their function.

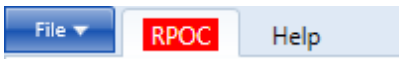


Figure 8: RDM Ribbon

Content Tabs

The Content Tabs is where the user can navigate through specific tabs. Switching between tabs in **ONLINE** mode automatically refreshes any parameters shown in the tab.

Figure 9: Content Tabs

Content Area

The content area on the main screen displays information pertaining to the RPOC. When a tab is selected, it opens in the content area where users can modify parameters as needed.

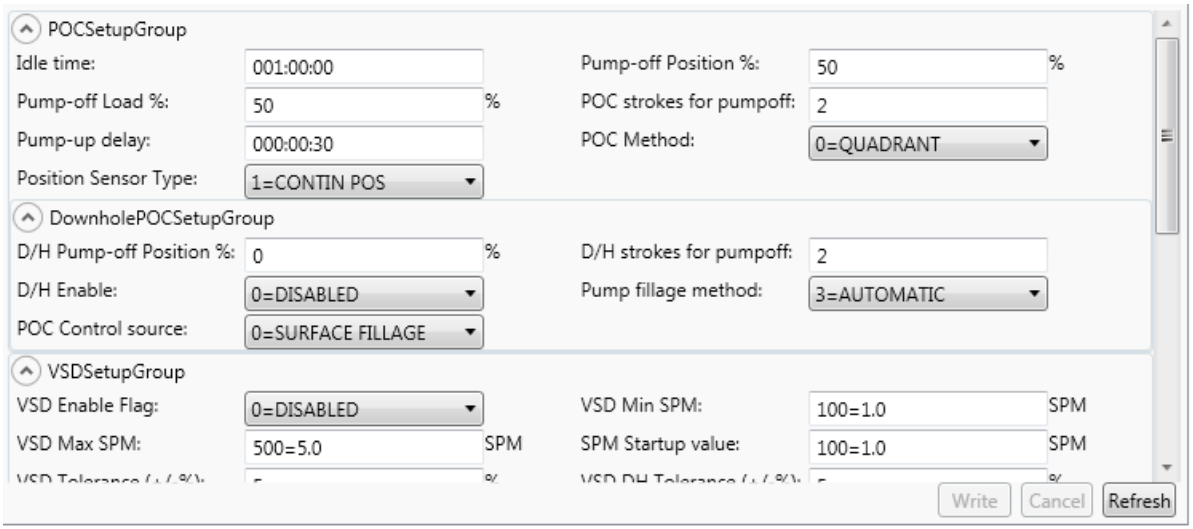
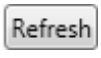
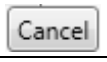
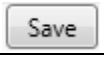
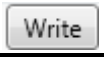


Figure 10: Content Area

Table 1: Navigation Options (available throughout RDM)	
Button	**Description**
	Collapses a Parameter Set View.
	Expands a Parameter Set View.

Table 2: Task Buttons and Options (available throughout RDM)	
Button	**Description**
	Updates live values (**ONLINE** mode only). Note: Any changes not written to the RPOC will be lost.
	Reverts back to previous settings in the open window.
	Saves the data in the open tab to the project (**OFFLINE** mode only).
	Writes data in the open tab to the RPOC (**ONLINE** mode only).

Status Bar

The Status bar is located at the bottom of the RDM window. From this toolbar users can see at a glance the connection status (**ONLINE** or **OFFLINE**), the status of the last 8500 read/write request, the Serial Port # (or IP address) of the RPOC, and the Unit ID. If the RPOC is offline then the Status bar will display "No Connection to RTU" instead of the RPOC's Serial Port # (or IP Address).

Offline and Online Modes

RDM has two connection modes available to the user, **ONLINE** and **OFFLINE**. The active mode is displayed on the status bar.

The following figure displays the Status bar in **OFFLINE** mode:

Figure 11: Status Bar, Offline

The following figure displays the Status bar in **ONLINE** mode:

Figure 12: Status Bar, Online

The connection mode can also be seen on the RPOC ribbon tab. The RPOC tab will be red when the RDM is in **OFFLINE** mode and green when the RDM is in **ONLINE** mode.

Figure 13: Connection Modes

Offline Mode

Upon start up, RDM launches in **OFFLINE** mode. As the name suggests this mode allows the user to utilize RDM offline without being connected to a RPOC. This mode simulates the RDM's database and allows projects to be modified without being connected to a RPOC. The projects can then be sent the next time the user connects to the RPOC.

NOTE

*In **OFFLINE** mode, RDM **CANNOT** display the real-time date present on the RPOC*

OFFLINE mode can be used to accomplish different tasks. Some of these tasks are as follows:

- Offline analysis of a field device that was previously captured (retrieved).
- Configure a project prior to sending it to the RPOC.
- Save a backup copy of the project.
- Open an existing project and use it as a baseline. Then save as a new project and continue to configure additional or wellsite-specific data.
- Plot Dynagraph files that have been saved on the PC.

Online Mode

In **ONLINE** mode, a direct connection with the RPOC is established giving users real-time access. **ONLINE** mode can be accessed by selecting the Connect option from the RPOC tab on the Ribbon.

The Connect Window, shown below, opens and the user must confirm the provided connection settings or provide new ones, click Connect to establish the connection.

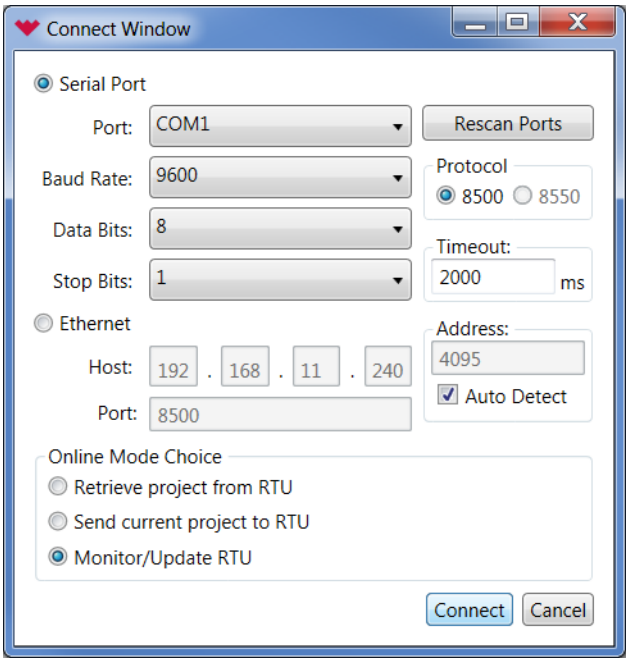


Figure 14: Connect Window

When making the transition from **OFFLINE** mode to **ONLINE** mode, an online mode choice must be selected to determine how the data is synchronized. The following table describes the available online mode choices:

Table 3: Online Mode Choices

Option	Description
Retrieve project from RTU	Retrieves parameters defined in Project Specific Tabs and saves the values to the project.
Send current project to RTU	Sends the setup parameters from the Project Specific Tabs of the current project to the RPOC.
Monitor/Update RTU	Quickly connects to the RPOC without transferring data.

Ribbon Controls

The RDM uses Ribbon tabs. Each Ribbon tab may contain one or more Ribbon groups. Each Ribbon group may have one or more Ribbon buttons. Below is a snapshot of the default Ribbon control.

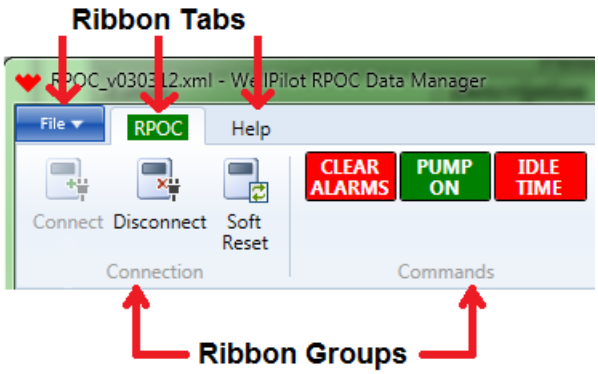


Figure 15: Ribbon Controls

File Ribbon Tab

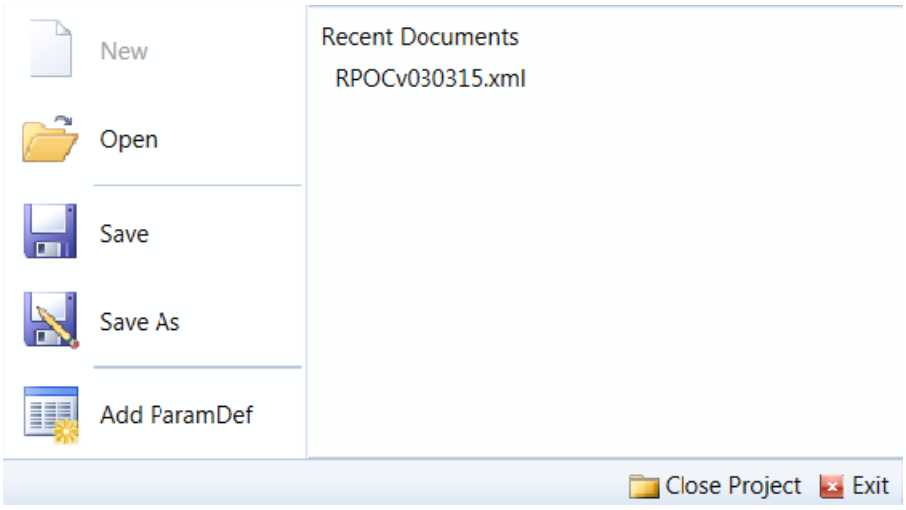


Figure 16: File Ribbon Menu

The File Menu includes the following options:

- New - *Currently unavailable* The factory default project is considered the starting point for all users. It is included with the RDM installation and can be provided by contacting a Weatherford representative.
- Open - The Open option launches a file-browse dialog box which allows an existing project to be opened.

CAUTION

*Opening a project while in **ONLINE** mode will automatically disconnect and require reconnecting to the RPOC*

- Save – The Save option allows the user to keep the active project. If the project has already been saved once and additional changes occur then click on [Save] immediately saves those changes to the already existing project.

- Save As – The Save As option allows the user to save the current project with a different name and/or location. By default, the project is saved in a default Projects folder in the user's AppData/ROAMING folder.
- Add ParamDef - As the RPOC develops, new parameters will be added and existing parameters modified. Rather than installing a new version of the RDM every time a change occurs in firmware, a new factory default project may be distributed along with a new parameter definition file. The Add ParamDef option opens a file browser dialog box where users can select single or multiple parameter definition files to add to the RDM. RDM will then copy the files from the source location to the Parameter Definition folder on the PC. A project will not open if the required parameter definition file is missing from the Parameter Definition folder. When complete, a success message is displayed.

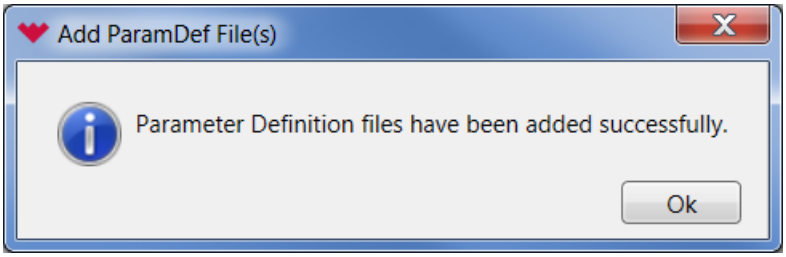


Figure 17: Add ParamDef

- Close Project - Saves and closes the active project and removes any Project Specific Tabs.
- Exit - Closes the RDM program.

Ribbon Groups

Each Ribbon tab contains Ribbon groups which have Ribbon buttons. The following Ribbon groups are available from the Ribbon tabs.

RPOC Ribbon Tab

Figure 18: RPOC Ribbon Tab Group

- Connection group
- Commands group

Help Ribbon Tab

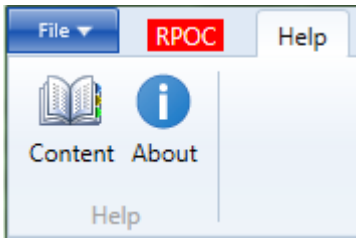


Figure 19: Help Ribbon Tab Group

- Help group

Ribbon Buttons

There are Ribbon buttons under each Ribbon group which are based on their corresponding functions. Access to buttons will vary depending on the connection mode (**ONLINE** / **OFFLINE**).

Following are the Ribbon buttons available in each Ribbon group:

Connection Group

Figure 20: Connection Group

The Connection group is available from the RPOC tab. It contains the following Ribbon buttons:

- The *Connect* button allows users to connect to the RPOC. This option is grayed-out when **ONLINE** because a user has already established a connection to the RPOC. Prior to connecting, the user is prompted to provide connection settings to connect to the RPOC. Once this information is provided, an online mode choice needs to be selected. Refer to the Online Mode section for the available online mode choices.
- The *Disconnect* button disconnects the RDM from the RPOC. It is only available when the RPOC is in **ONLINE** mode.
- The Soft Reset button resets the RPOC. Available in **ONLINE** mode only.

Commands Group

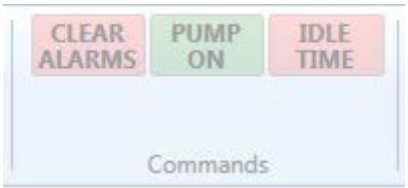


Figure 21: Commands Group

The Commands group is available from the RPOC tab. It contains the following Ribbon buttons:

- The *CLEAR ALARMS* button clears all clearable alarms on the RPOC.
- The *PUMP ON* button sends a command for the RPOC to start the pump.
- The *IDLE TIME* button sends a command for the RPOC to shut the pump down.

Help Group

Figure 22: Help Group

The Help group is available from the Help tab. It contains the following Ribbon buttons:

- The *Content* button opens the PDF Help file for RDM.
- The *About* button provides the version information for RDM

Database Concepts

The default project included with the RDM or a custom project provided for Weatherford customers determines the size and complexity of the RDM database as well as the RPOC's firmware version.

Content Tabs

Content Tabs provide an interface for managing the RPOC database while connected or disconnected to an RPOC. It is located near the top of the RDM main screen. The purpose of Content Tabs is to allow the user to view and manage their RPOC easily by grouping parameters and functionality logically. The tabs are recreated every time a new project is opened. Content Tabs will vary depending on the projects used.

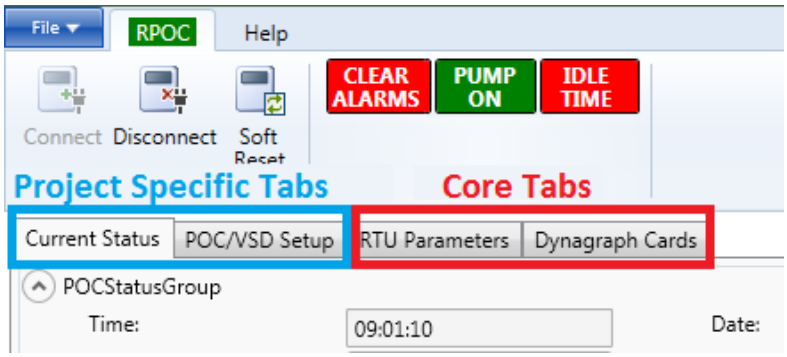


Figure 23: Specific and Core Tabs

The RPOC Content Tabs are divided into two categories: Project Specific and Core Tabs.

Project Specific Tabs

Project specific tabs appear every time a new project is opened. They are **only available if a project is open**. The purpose of these content tabs is to provide the user with quick access to commonly used parameters and functionality. Parameters accessed through these tabs are stored in the project and may be saved and loaded at any time. Currently, there is only one type of project specific tab.

Parameter Tab View

Like other tabs, Parameter Tab Views are used to logically organize a project. They group parameters together and allow the user to read/save/write to and from these parameters. A Parameter Tab View can be created for individual applications or may display parameters across multiple applications. Each Parameter Tab View can consist of up to four levels, the tab itself as well as two levels of Parameter Set Views and Parameter Views.

Table 4: Parameter Tab View Levels

Level	Description
Parameter Tab View	Selected by the user to display the content within.
Parameter Set View Lv. I	Groups parameters together within a tab. Users can expand or collapse these groups to focus only on the parameters they need to configure. Can contain Parameter Views as well as other Parameter Set Views.
Parameter Set View Lv. II	A group within a group. Can be expanded or collapsed. Can only contain Parameter Views.
Parameter View	Parameters defined in the RPOC. Some are user configurable while other are read only.

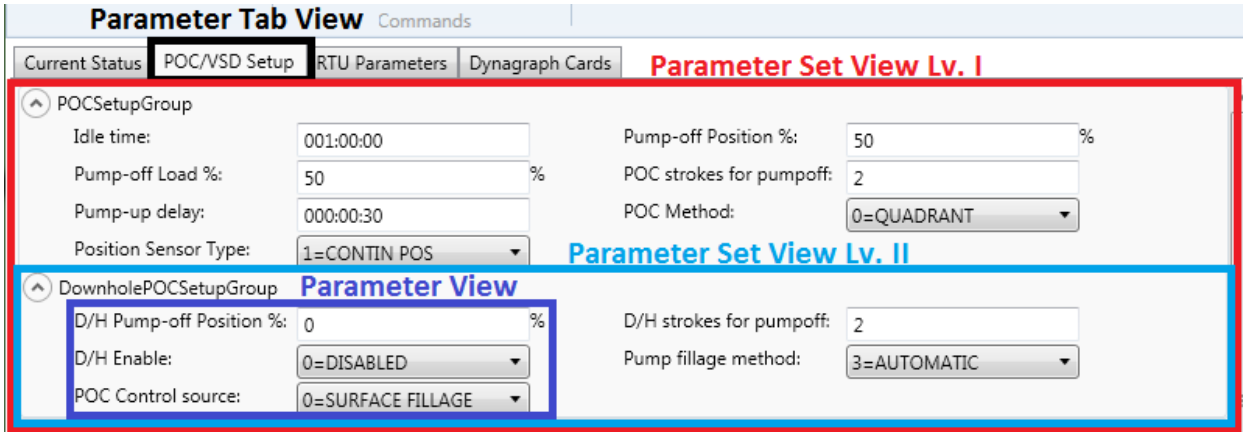


Figure 24: Parameter Tab View

Core Tabs

Core Tabs are the foundation of RDM and provide a basic structure for the program. These content tabs are common to all projects and are **always available in RDM, even if no project is open**. Parameters accessed through these tabs can be written and saved in the RPOC but are not linked to a RDM project and therefore are not saved in the project file. Core tabs are briefly described in the table below.

Table 5: Parameter Tab View Levels

Level	Description
RTU Parameters	Allows the user to specify individual or groups of parameters to access in the RPOC database. These parameters can be user configurable or read only. All parameters in the RPOC are accessible through this tab.
Dynagragh Cards	Retrieves and displays dynagraph cards graphically. Retrieves Surface and/or Downhole Startup, Shutdown, Current, or Event cards. Retrieved a filtered list of event cards. Exports/Imports cards and events in the following file formats: DYN, WDYN, WEVT.

Projects

The RDM software utilizes projects and parameter definition files.

- The project file defines the project specific tabs, saves the last parameter values written/read, and points to a parameter definition file. The extension is .xml.
- The parameter definition file provides details about the parameters that are available in the RPOC. It is tied to a range of firmware versions and must be updated when new parameters are added or the properties of existing parameters are modified. The extension is .xml.

CAUTION

Modifying these files can result in the failure of the RPOC Data Manager to operate.

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Using WellPilot RPOC Data Manager

Once installation is complete, the RDM icon is installed on the desktop (if option was selected during installation). RDM can be opened via this icon or by navigating to **Start → All Programs → Weatherford → WellPilot RPOC Data Manager → RPOC Data Manager**.

Once opened, the Main Window will appear with the Core Tabs available. From here, the user can take one of two paths: Open a project or quickly connect to an RPOC.

Open a Project

Opening a project is the most common way to the RDM. Doing so will bring up Project Specific Tabs which allows the user to easily setup and monitor the status of an RPOC. Projects also allow the user to review/configure a project **OFFLINE** before sending it to the RPOC. A serial/Ethernet connection between the local PC and the RPOC is not required.

1. Go the File Tab Menu and choose Open to bring up the Open window.
2. Select a project from the Projects folder by double clicking on it or highlight the project and click the Open button.

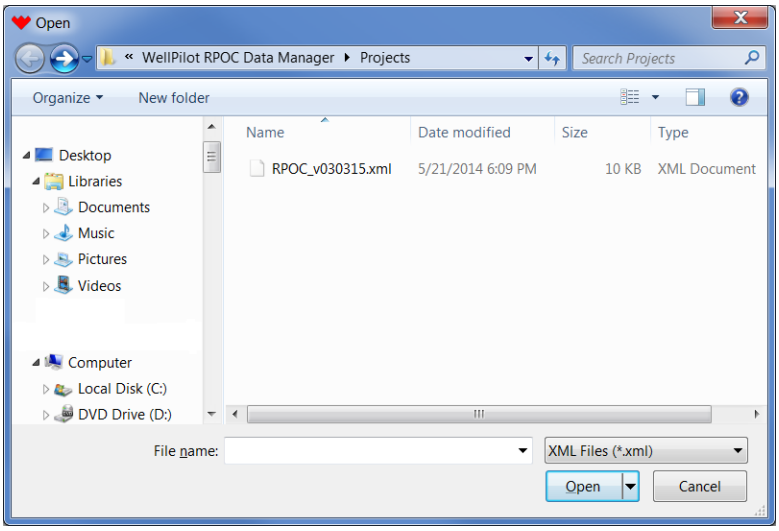


Figure 25: The Open Window

NOTE

The recommended naming format for projects includes creating a new folder for the site name followed by naming the file based on product name, firmware version, and project revision. For example, if the RPOC site name is Black Beauty, the firmware version is 03.03.12, and the project revision is A, the recommended project would be RPOC_v30312a and the folder will be called Black Beauty. Additionally, a folder can be created for a company, with site folders within the company folder

3. The project will open in **OFFLINE** mode with the Project Specific Tabs + Core Tabs. From here, users can use the Project Specific Tabs to review/configure the project offline

Quick Connect

A project is not always required to connect to an RPOC. Connecting to an RPOC without opening a project allows the user to use the Core Tabs only. Here the user can retrieve/save Dynagraphs and

Events through the Dynagraph Cards tab and access parameters by parameter number through the RTU Parameters tab

CAUTION

Connecting to an RPOC without a project does not provide firmware version information to the RDM. Therefore, RDM will use the latest RPOC parameter definition information that came with the installation. Connecting to an older/newer firmware version may fail if the user attempts to access parameters that are different than the parameter definition that the RDM is using. For older versions, this could mean that the RDM may attempt to access parameterS that did not exist or write values that were not valid at the time. For newer versions, this could mean that the RDM will not be able to access new parameters or write values that were not available at the time the parameter definition was released.

Project Specific Tabs

Parameter Tab View

Parameter Tab Views group parameters together and allow the user to read/save/write to and from these parameters. A Parameter Tab View can be created for individual applications or may display

parameters across multiple applications. Each Parameter Tab View can consist of up to four levels, the tab itself as well as two levels of Parameter Set Views and Parameter Views.

Parameter Views

While the first three levels provide a visual structure to the RDM database, Parameter Views provide the actual connection between the RDM and the RPOC parameters.

In general, all Parameter Views have the following features:

- **Description** - The Description holds the name and function of the assigned value or parameter. Typically the Description will match the parameter description viewed through the EGD in the RPOC's Parameter Table. However, a project may include use its own custom description for any parameter displayed in the Parameter Tab View.

Figure 26: Parameter View

- **Value** - The Value holds the current or updated value of the RPOC parameter. How a parameter is displayed visually and how the user is allowed to modify a parameter varies based on the parameter type. There are five basic ways to display/modify parameter values:

Table 6: Parameter Values

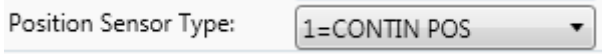
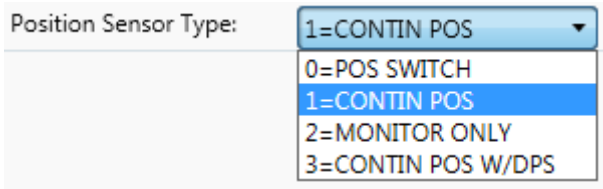
Display / Modify Type	Description
Selection Box	Selection parameters show the currently selected value in a Text Box style box.  Clicking on the Selection Box opens a dropdown list of values. The user can make a selection by clicking one of the values, typing the selection index #, or using the up/down arrow keys on the keyboard. 

Table 6: Parameter Values

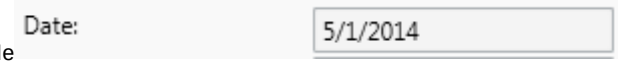
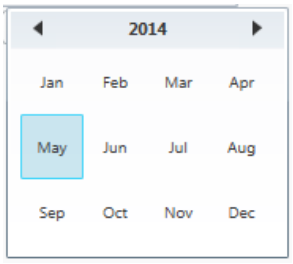
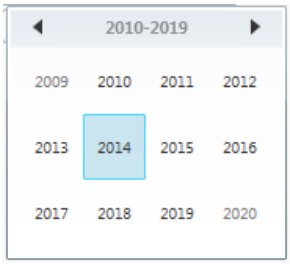
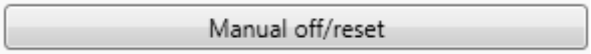
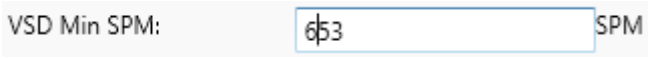
Display / Modify Type	Description
Date Picker	Date parameters display the date in mm/dd/yyyy format. These parameters have two ways of displaying the values. If the parameter is RO, then the value is displayed in a Masked Text Box style  If the parameter is RW, then the value is displayed in a Masked Text Box style box with an additional calendar icon next to the value  The user can modify the date by typing into the Masked Text Box or by clicking the calendar icon. The calendar icon brings up an interactive calendar where the user can choose a date. The left and right arrow moves to the previous/next month. Clicking on the “month, year” text in-between the arrows allows the user to select a month within a calendar year. Clicking on the text again allows the user to select a year within a 10 year span.   
Masked Text Box	Masked parameters require a special separator to display the value.  The following separators are supported for a Masked Text Box: ***Separator*** / ***Description*** : — Used by time parameters to separate hh:mm:ss. . — Used by IP parameters to separate IP addresses, MAC addresses, etc. / — Used by date parameters to separate mm/dd/yyyy.
Command Button	Command parameters do not have a value or unit associated with it. Instead, command parameters are displayed as a button with the Description inside the button.  The Command Button is also unique in that clicking on a Command Button immediately executes the command (user does not need to press the Write button).

Table 6: Parameter Values

<table>
<tr><th>Display / Modify Type</th><th>Description</th></tr>
<tr><td>Text Box</td><td>
Most parameters take the form of a Text Box. The Text Box is formatted to display the value based on the parameter type. The parameter type can be a combination of any of these formats:
<table>
<tr><th>Format</th><th>Description</th></tr>
<tr><td>Size</td><td>A parameter's memory size can be a Byte, Word, Long, Float. Attempting to write a value beyond the size allocated to a parameter will result in an error message.</td></tr>
<tr><td>Sign</td><td>A parameter's value may be signed or unsigned.</td></tr>
<tr><td>Base</td><td>A parameter can be displayed in different bases: decimal, hexadecimal, octal, or binary. The user can then modify the parameter in the expected base.</td></tr>
<tr><td>Multiplier / Offset</td><td>Some parameters are stored as one value, and displayed as another. This is done by applying multipliers and offsets to the parameter's value.
The multipliers and offsets may be hardcoded for some parameters while others are defined by a second parameter (i.e. decimal places shown for parameter #282 is defined by parameter # 284). If the multiplier/offset is defined by another parameter, clicking the Refresh button collects both the parameter value and the multiplier/offset parameter values.</td></tr>
</table>
Parameters that require multipliers/offsets may need to be displayed as a floating point even though internally they are not. In this case, the Text Box will show the raw value followed by an equal sign and the converted value.


For example, when VSD Min SPM (parameter #1256) is set to 4.53 SPM, the user will see "453 = 4.53". If the user clicks on the Text Box to change the SPM, the equal sign and everything right of it will disappear and the user will be able to enter a new raw value.


After clicking out of the Text Box, the equal sign reappears with the new converted value.


</td></tr>
</table>

- **Unit** - The Unit holds the unit information associated with a parameter or function. If a parameter does not have a unit association, this area will be empty. The Unit may be hardcoded for some parameters while others are defined by a second parameter (i.e. unit association for parameter #282 is defined by parameter # 285). If the Unit is defined by another parameter, clicking the Refresh button collects both the parameter value and the Unit parameter values.

Each Parameter View is associated with a parameter number. To identify the parameter number, the user can hover the mouse over the parameter Description. A tooltip will appear defining the parameter number.

Modifying Parameters

The user can modify multiple parameters within a Parameter Tab View before clicking the Write (**ONLINE** mode only) or Save (**OFFLINE** mode only) button to confirm the changes. A modified parameter is identified by a blue highlight over the parameter value.

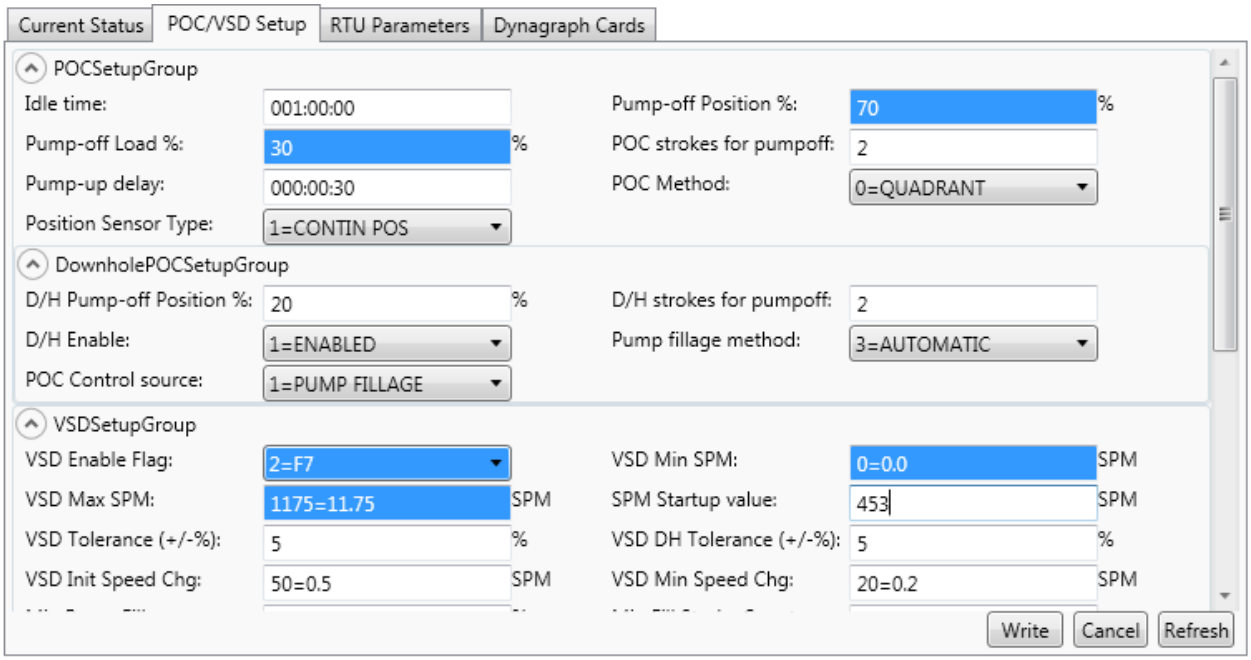


Figure 27: Modifying Parameters

While parameters have been modified but not written/saved, the user can click Cancel to revert the parameters to their previous values or click Refresh to update the tab with the parameter values on the RPOC

NOTE

Clicking Cancel reverts the parameter values to their previous values not the current value on the RPOC.

Clicking the Write button (**ONLINE** mode only) will send only the modified values to the RPOC. If all values were written successfully, then a “Success” message will appear in the Status bar.

If the Write attempt fails, the Status bar will display the error information received from the RPOC. RDM attempts to send all modified values to the RPOC, if it fails to write to a particular parameter, it will skip the parameter and continue writing to other parameters. After attempting to write to all parameters, only those that were not successfully written will remain highlighted. The user can then decide to attempt another write for those remaining values or modify/cancel the changes.

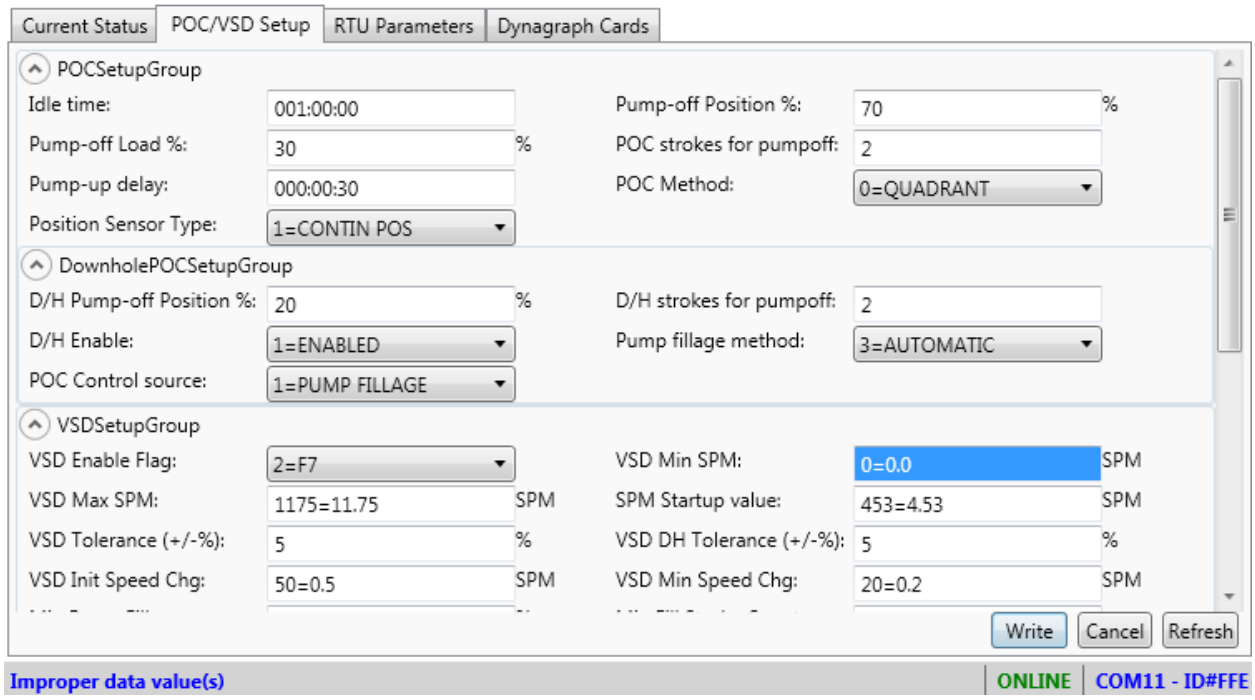


Figure 28: Improper Data Values

In cases where the RDM fails to write to multiple parameters, the status bar will indicate that multiple errors occurred and an Error Log button will appear in the Status bar that allows the user to view all errors responses returned

Figure 29: Multiple Error Responses Detected

Core Tabs

RTU Parameters

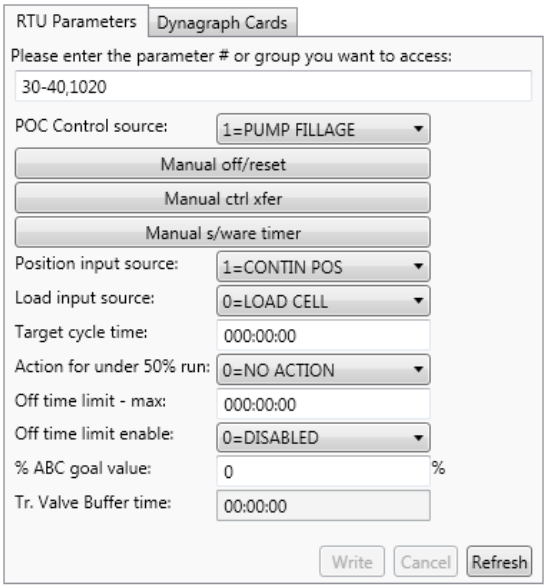
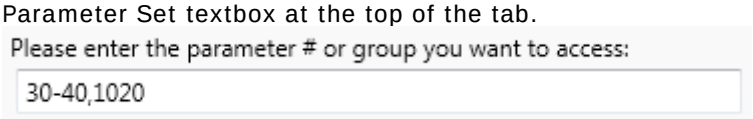


Figure 30: RTU Parameters

The *RTU Parameters* tab allows the user to specific individual or groups of parameters to access in the RPOC database. These parameters can be user configurable or read only. All parameters in the RPOC are accessible through this tab. This tab is only used in **ONLINE** mode. In **OFFLINE** mode, users can view the last values retrieved but changes made will be lost when RDM is opens/closes a project or the user reconnects to a RPOC.

Setup

To choose which parameters to monitor in the RTU Parameters tab, enter the parameter # in the Parameter Set textbox at the top of the tab.



The following characters are allowed in the Parameter Set textbox:

Table 7: Parameter Set Textbox Allowed Characters

Character	Description
Numeric	Defines the parameter number(s) to monitor. For example, enter “1020” to monitor parameter #1020.
(0-9)	Used to define a range of parameters. For example, enter “30-40” to monitor parameters: 30 through 40.
Dash	Used to separate individual parameters numbers and parameter groups. For example, “30-40, 1020” defines one group “30-40” and one parameter number “1020” to monitor.

Spaces and other characters are not allowed. Once all parameters and parameter groups are listed, the user can press the Enter key or the Refresh button to update the tab with the parameter values.

Monitoring RTU Parameters

RTU Parameters are listed vertically in the order they were defined by the Parameter Set textbox. The RDM attempts to fit all parameters in a signal column. However, if the window does not fit all parameters vertically, new columns are created to fit the rest of the parameters. Users can modify the parameters in this tab as they would modify parameters in the Parameter Tab View.

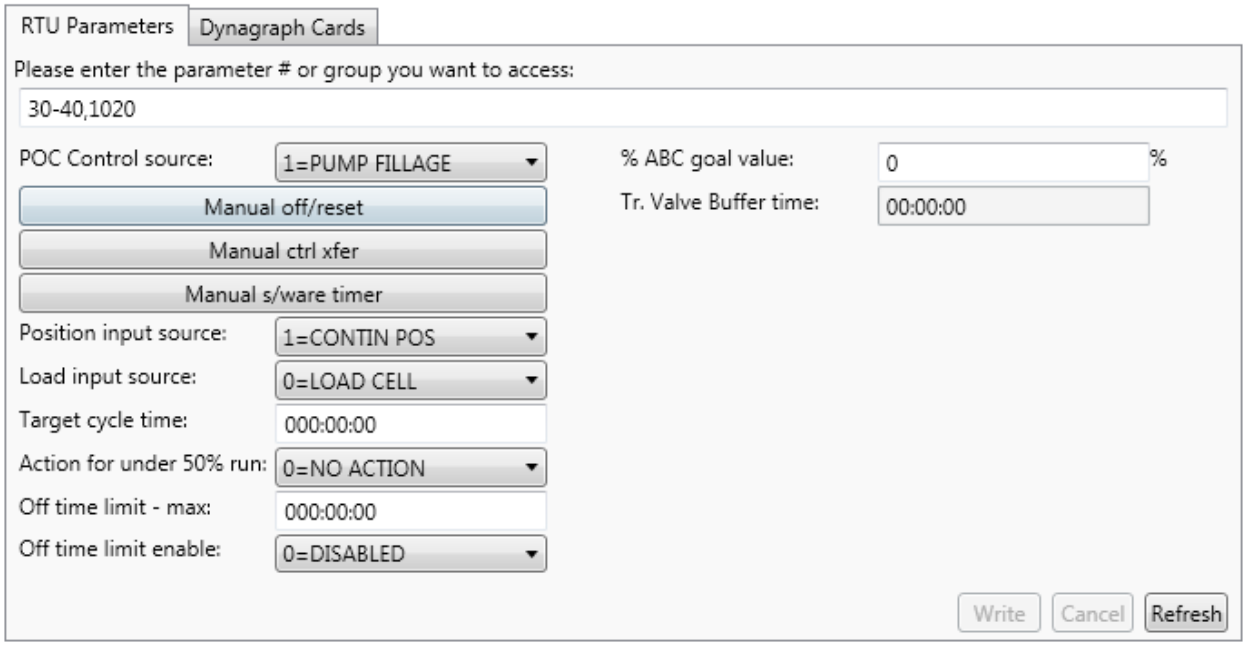


Figure 31: Monitoring RTU Parameters

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Dynagraph Cards

By opening the Dynagraph Cards tab, the user can retrieve and display Dynagraph cards. Dynagraph cards show a full rotation of the Sucker Rod Pump and the load that is acquired during the rotation

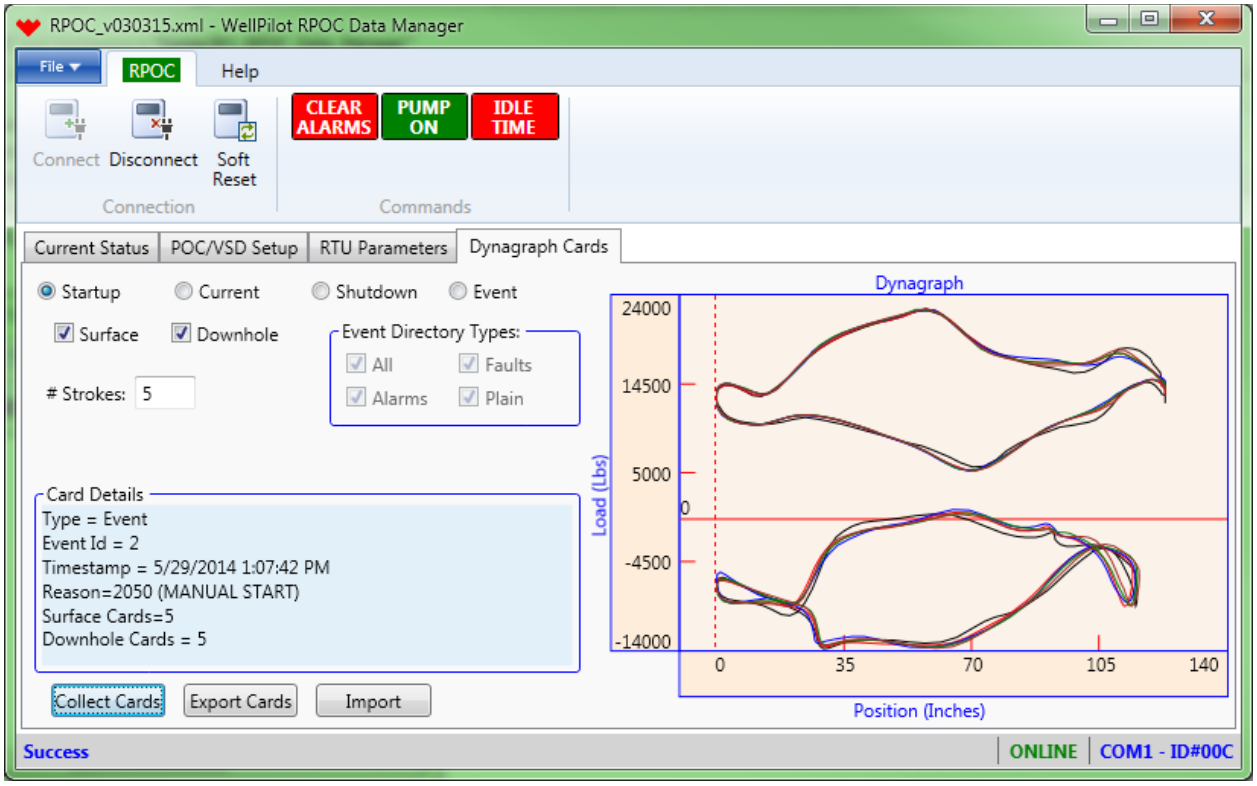


Figure 32: Dynagraph Cards

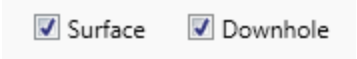
Card Collection

Setup

Card collection is based on:

- Collection Type – The time that data is collected (Startup, Shutdown, Current, Event).

- Card Type – Surface, Downhole, or both.



- # Strokes – The number of Dynagraph cards to collect. This can be anywhere from 1 to 5 cards. Requesting 5 cards would return 5 Surface cards and/or 5 Downhole cards, depending on the Card Type(s) selected.
- Collect Cards – Clicking the *Collect Cards* button will request the card data from the RPOC based on the user's selection. This option is only available in **ONLINE** mode.

NOTE

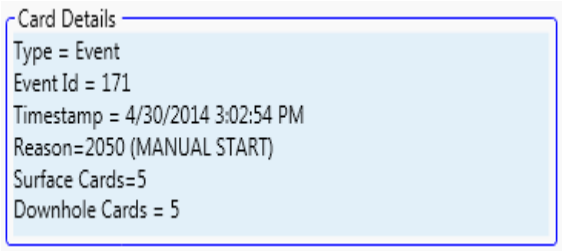
In order to collect a Current card, the pump must be running. When the pump is idled, other cards (stored in the RPOC buffer memory) can be retrieved.

Analyzing Cards

The following information is provided with every card request:

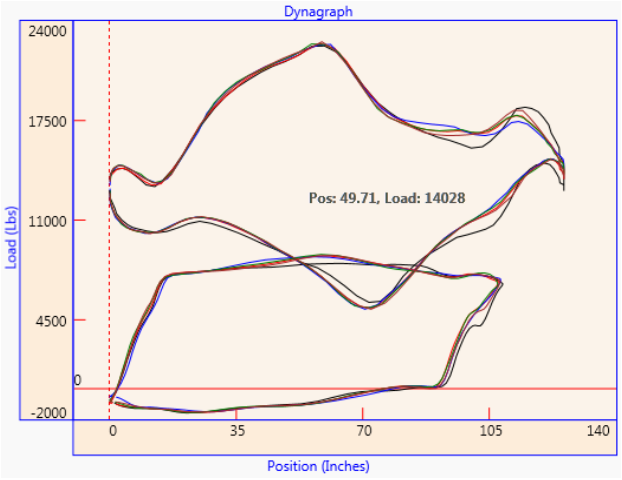
- 8500 Request Status – The Status Bar at the bottom of the main screen displays the status of the card request. A successful request will return a “Success” message while unsuccessful requests return an error code.

- Card Details – The Card Details box displays information about the cards requested. The information may include:



  - Type – The event type for the cards. Can be an Event, Live, Alarm, or Fault.
  - Event Id – An index that represents where the event lies on the RPOC’s event buffer. Can be 0-255. Does not apply to Current cards.
  - Timestamp – Represents the date and time when the event was captured. For Current cards, the Timestamp equals the current time on the RPOC when the cards were retrieved.
  - Reason – An event code that describes what triggered the event. Does not apply to Current cards.
  - Surface Cards – The number of Surface cards available in the event. If requesting less than the number of cards available, this number represents the number of cards collected. If only collecting Downhole cards, this number will still show how many cards can be retrieved if the user were to check the Surface option.
  - Downhole Cards – The number of Downhole cards available in the event. If requesting less than the number of cards available, this number represents the number of cards collected. If only collecting Surface cards, this number will still show how many cards can be retrieved if the user were to check the Downhole option.

- Dynagraph – Cards are plotted in the Dynagraph area. Up to 5 Surface and Downhole cards can be plotted with color coding differentiating each card.
  Hovering the mouse over the Dynagraph area provides load and position data relative to where the mouse is pointing

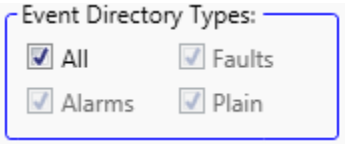


Event Collection

Setup

Event collection is based on:

- Event Directory Type(s) – The *Event Directory Types* is used to filters event requests from the RPOC. For example, checking Faults will retrieve only Fault events from the RPOC (**ONLINE** mode only). This option is only available when Collection Type is set to Event.



- Collect Events – Clicking the *Collect Events* button will request the list of events from the RPOC based on the user's selection. This option is only available in **ONLINE** mode.
- View Cards/ View Events – Clicking the *View Cards*/*View Events* button will switch between viewing the last card retrieved and viewing the last event list retrieved. The button is only visible when the Collection Type is set to Event and if there is a card to view (otherwise only the Event list will be shown).

Analyzing Events

The following information is provided with every event list request:

- Events Grid – The Event list collected from the RPOC is displayed in a grid format and sorted from new to old. The following columns are populated for each event in a Collect Events request:

Table 8: Events Grid

Column	Description
Event #	An index that represents where the event lies on the RPOC's event buffer. Can be 0-255.
Reason	An event code that describes what triggered the event. Does not apply to Current cards.
Timestamp	The date and time when the event was captured.
Cards	Number of cards available for retrieving. When Downhole cards are available, an equal number of Surface and Downhole cards exist. For example, 5 cards would mean 5 Surface cards and 5 Downhole cards.
DH?	Note: Event cards are captured when an event occurs in the RPOC. These cards may or may not contain a full 5 stroke buffer. These cards are intended to capture what was happening at the time the event occurred.

Importing / Exporting

Import and Export buttons are provided for saving the current cards or events to the PC to replay later.

Exporting Cards / Events

The Export Cards button invokes a Save Dynagraph window. Here, the user can choose a format to save the card data. Clicking Ok opens a Save As window to allow the user to choose a file name and directory. This button is available only when a card has been collected and the Dynagraph is visible.

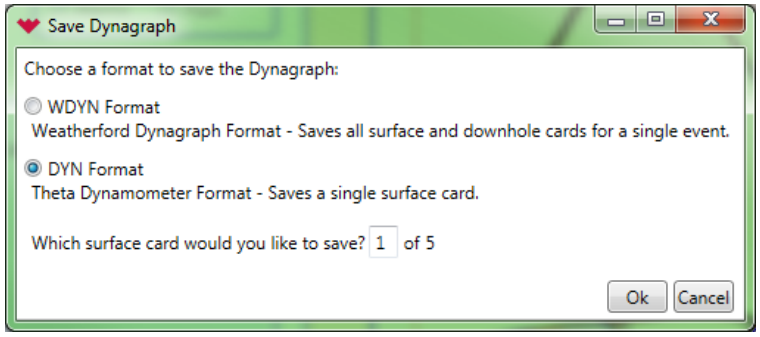


Table 9: Card Data Format

Format	Description
WDYN	Weatherford Dynagraph Format – Saves all surface and downhole cards for a single event in one file. Allows the RDM to replay all 5 surface and downhole cards.
DYN	Theta Dynamometer Format – Industry standard format. Saves a single surface card. The user can choose which of the five surface cards to save. RDM will only be able to replay the surface card (no downhole). Other software can use this file to replay both surface and downhole.

The Export Events button invokes a Save As window and will allow the user to choose a file name and directory to save the Events. Only one file format is supported, WEVT (Weatherford Event Files). This button is available only when events have been collected and the Event Grid is visible.

Importing Cards / Events

Invokes an Open window that allows the user to select a saved Dynagraph or Events file. Clicking on a saved file and then clicking Open will open, load, and display the file on the Dynagraph / Event Grid.