500 DataMod Tool

User Guide

contrec

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500 DataMod Tool - User Guide

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Chapter 1
Introduction

Welcome to 500-Series DataMod Tool

This User Guide relates to the use of the 500-Series DataMod Tool. The DataMod program enables you to perform the following functions for a 500-Series based instrument:[1]

- Collect logged data from 515-Series instruments via Modbus RTU protocol
- Customise data tag names and report header
- Display collected data
- Generate PDF report from default and custom templates
- Export data in CSV format

The tool is simple to use and data is easy to collect. The program allows multiple custom set-ups to be saved for easy re-use, automatically starts with the previous configuration and allows saved reports to be re-opened. All of this is achieved without the configuring a single Modbus register!

System Requirements

The 500-Series DataMod Tool has the following system requirements:[2]

- Windows based Personal Computer
- 256MB Memory (or higher)
- 10MB available Hard Disk space
- Display Resolution 800 x 600 minimum
- Serial communications port
- Microsoft Windows 7 (or higher), normal DPI setting
- Adobe Acrobat Reader V4.0 or higher (to view/print generated reports)
- Microsoft Internet Explorer V4.0 (or higher) or similar Web Browser to view online help (recommended)
- Internet access for periodic software verification

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1. The DataMod tool is compatible with 515 instruments with software versions starting from 2.9.080. See your distributor for support.
2. It is not possible to have multiple 500 DataMod applications open on the same device.

User Licence

The 500 DataMod program is able to be installed as a time limited fully operational trial version.

An installation of the trial version of the 500 DataMod can be changed to a fully licenced installation with the entry of an activation code.

A single licence allows the 500 DataMod program to run on a single computer. Software licence will be validated, periodically requiring internet access.

Installation

Use the following procedure to install the software onto a computer:

1. Select and Run the 500-DM-x.x.xxx.exe file from appropriate local drive or internet link.
2. If necessary, provide authorisation to Run the InstallShield program.
3. The InstallShield Wizard will start with a typical welcome screen.

   It is recommended to allow the default installation to take place (the default location for installation is C:\Contrec\500-DataMod\).
4. Follow the remainder of the instructions of the InstallShield Wizard on the screen to complete the installation.

Hardware Connection

The 500 DataMod Tool uses Modbus RTU protocol to collect logged data from a 515 Series instrument. To use the DataMod program there must be a transparent and robust serial communication connection between the instrument and the computer running DataMod.

515 Instrument Connection

The 515 instrument has RS232 and RS485 serial ports. Either port can have the Modbus RTU protocol assigned to it and both ports have the ability to set the baud rate, parity and stop bits as required. The 515 instrument can also have the Modbus address set as required. The default factory setting for a 515 instrument is for Modbus RTU protocol to be assigned to the RS485 port, where the default settings are 19200 baud rate, even parity and 1 stop bit.

The RS232 port can be used when there is only one 515 instrument to communicate with over a short distance and there is no need to use the RS232 port for another protocol or function, such as a local printer output.

The RS485 port is used when there are multiple instruments to communicate with on the same ‘network’ or when there is a significant distance between the 515 instrument and the computer collecting the data.

Computer Port Connection

It is common nowadays for Microsoft Windows based computers not to have a RS232 or RS485 serial port. Most computers have wireless, USB or Ethernet ports and rely on serial communication converters to connect to external RS232 or RS485 devices.

There are many such serial communication converters available, but the device used must be robust, have a reliable windows driver and operate as a transparent serial port.

The 500 DataMod tool allows the user to select the appropriate serial port on the computer. It also provides access to set all the normal serial communication port settings, such as baud rate, parity and stop bits. These must be set to match the settings used in the 515 instrument.

DataMod Introduction

Starting DataMod

To start the 500 DataMod software, double click on the **500 DataMod** icon on the Windows desktop. The program starts with a typical welcome screen as shown in Figure 1.

Figure 1 500 DataMod Welcome Screen

The main screen of the 500 DataMod tool is shown in Figure 2. The main Toolbar is found on the right hand side and the tabs (***Report Items*** and ***Report Data*****)** switch between the two main viewing screens.

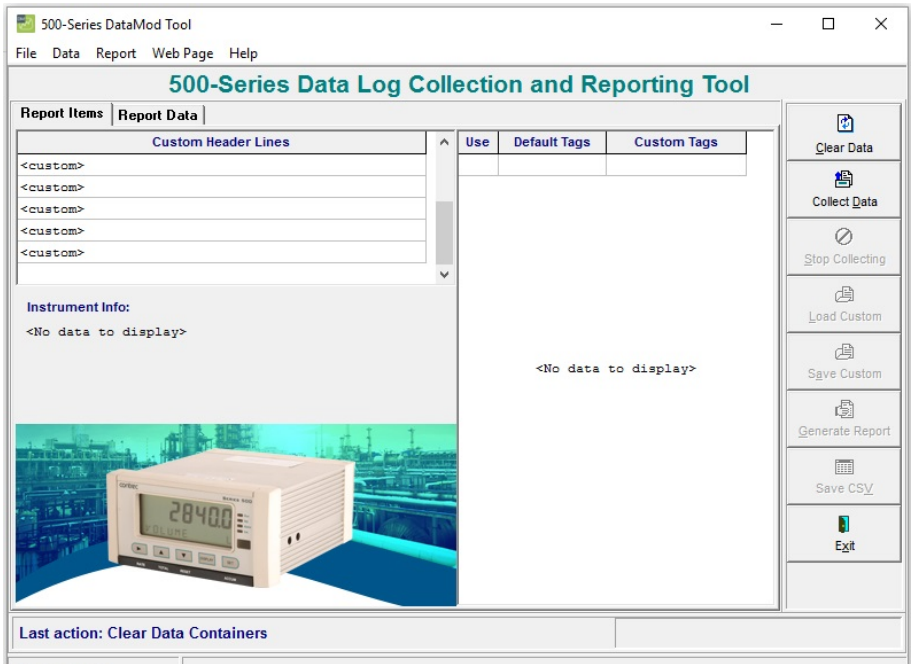


Figure 2 500 DataMod Main Screen

The ***Report Items*** and the ***Report Data*** screens will become populated after some initial data has been collected from a 500-Series instrument.

Report Items Screen

The ***Report Items*** tab displays a screen with the following key features:

- **Default and Custom Tags** - This section displays the list of the instrument variables with their default tags (names) and provides the ability to enter ***Custom Tags*** and to choose the variables to be included in the reports. ***Custom Tags*** and variable selections can only be made after the initial data has been collected.

- **Custom Header Lines** - This section allows the user to enter up to 5 lines of custom header information that will be included in the reports.

- **Instrument Info** - This section is populated with information collected from the instrument including:
  - Hardware model information
  - Application pack and input usage
  - Program Manager software version used to create application
  - Custom version number
  - Instrument name and serial number.

- **Information and Progress Bar** - This section provides feedback regarding the current program status or the previous action carried out.

Report Data Screen

The ***Report Data*** tab displays a screen with the tabulated data collected from the instrument. There are horizontal and vertical scroll bars to allow all fields of data to be viewed.

Only the items selected in the variables list on the ***Report Items*** screen will be shown in the table of data.

The default variable tags and units of measure (as extracted from the instrument) are listed along the top row of the table and repeated as fixed labels at the bottom of the table to always remain visible. The ***Custom Tags*** (names) are shown in the yellow shaded row at the top of the table.

The quotation symbol (**“**) is used to indicate that no custom tag has been entered for that variable.

Menu & Toolbar

Menu Bar

The menus and sub items as listed in Table 1 are found in the menu bar along the top of the screen. Some functions are also found in the side toolbar. Please refer to the Toolbar functions below for full description.

Menu	Sub Item	Function
File	Load Custom	Open a previously saved DataMod custom text file.
	Save Custom	Save DataMod custom text and item selection file.
	Exit	Exit program.
Data	Clear Data	Clear any custom text and any data previously collected.
	Collect Data	Open the dialog box to start the data collection process.
	Stop Collecting	Stop the data collection process.
Report	Open Report	Open a previously saved report in the Preview screen.
	Load Template	Load a custom report template created and supplied by Contrec (contact your distributor for details).
	Save CSV	Save collected data report to a CSV file.
	Generate Report	Generate and open report in a Preview window with the ability to print, save or export as PDF.
Web Page		If internet connection is available, the Contrec website is opened using the computer default browser.
Help	User Guide	Open the 500 DataMod User Guide (this document) in Adobe PDF Reader.
	About	Display the version details of the 500 DataMod program.

Table 1 500 DataMod Menu

DataMod Toolbar

The 500 DataMod toolbar buttons (found on the right hand side) provide the functions as described in Table 2.

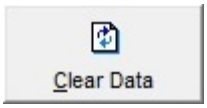
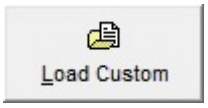
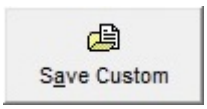
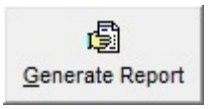
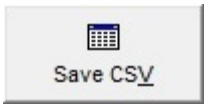
Option	Toolbar Button	Description
Clear Data		Clear any previous data that has been collected. Also clears any custom text and any custom variable selections.
Collect Data		Open the Data Collection Options dialog box to start the data collection process.
Stop Collecting		Allow the data collection process to be stopped. The data collected prior to stopping the process is retained.
Load Custom		After data has been collected, a previously saved custom configuration can be loaded to apply preferred variable selections and custom text.
Save Custom		Custom settings that have been applied to collected data can be saved for convenient re-use in the future.
Generate Report		After data has been collected (and any relevant custom settings have been applied), a report can be generated from the ***Report Data***. The report will be opened in a Preview window with the ability to print, save or export as PDF.
Save CSV		After data has been collected (and any relevant custom settings have been applied), the ***Report Data*** can be saved in CSV format for future use with other applications.
Exit		Exit the 500 DataMod program.

Table 2 500 DataMod Toolbar Buttons

Chapter 2
Operation

DataMod Operation

This section of the 500 DataMod Tool User Guide describes how data can be collected from a 515 instrument with compatible application software.[1]

The 500 DataMod software is used to collect data from an instrument and allows custom tags, custom header text and the selected variables to be displayed as a table of ***Report Data***. The prepared data can then be used to generate a structured report that can be saved, printed or exported in PDF or CSV format.

Figure 3 below shows a typical ***Report Items*** screen after data has been collected and some custom header, tags and selections have been made.

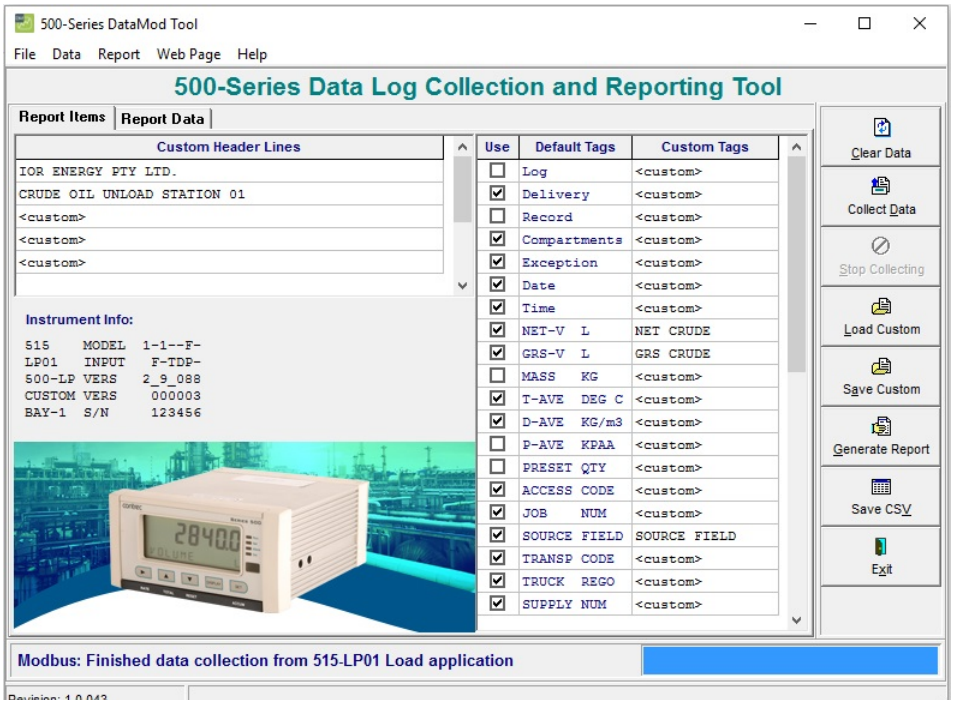


Figure 3 Example 500 DataMod Report Items screen

The instructions and information provided below will describe how the functions and features of the 500 DataMod program are used to collect and present important field data as required.

1. The DataMod tool is compatible with 515 instruments with software versions starting from 2.9.080. See your distributor for support.

Logging Types

The 500 DataMod program uses industry standard Modbus RTU communications protocol to access the logged data held in the instruments. The 515 instrument can be a Flow type application (with time based logging) or a Batch/Load type application (with delivery or transactions based logging).

When viewing the logged data on the 515 instrument (or retrieving via serial communication), it is important to understand how the logs are numbered, i.e. log indexing/numbering always starts from the most recent log and continues towards the older logs in chronological order, so once the new logging occurs it becomes available as the Log Number 1 and so on.[1]

Time based logging

When an instrument uses time based logging, a log is taken at the rollover of the time base (i.e. on the hour for hourly logs, etc.).

The most recent log of any particular time base is numbered as Log 001 with older logs having increasing numbers. For example, a log that was stored 5 time bases ago (if hourly logs, 5 hours ago) will be numbered as Log 005, etc.

Delivery based logging

When an instrument uses delivery or transaction based logging, a log of the relevant batch or load information is taken at the end of a delivery.

The most recent delivery log is numbered as Log 00001 with older logs having increasing numbers. For example, a log that was stored 5 deliveries ago will be numbered as Log 00005, etc.

A unique delivery number is also assigned to each batch or load and is stored as part of the logged data. The delivery number increments with each batch or load made and it is only reset when the instrument logs are cleared.

Typically the logs are collected starting from the most recent one (Starting Number set to 1), but users can change the logs retrieval ***Starting Number*** and ***Number of Logs*** to suit their needs. For example, if the most recent delivery number is 000124, but the desired delivery numbers to be collected are from 000101 to 000120 (20 records), then the ***Starting Number*** can be set to 5 and the ***Number of Logs*** to 20 (refer to Figure 4).

1. Logged data includes snapshot of application's relevant main menu variables together with the time/date stamp. In addition, logs of Batch/Load applications also include unique (sequentially incremented) delivery number.

Setup to Collect Data

The 500 DataMod program uses industry standard Modbus RTU protocol to access the logged data held in the instruments. The 515 instrument can be a Flow type application (with time based logging) or a Batch/Load type application (with delivery or transactions based logging). Both types of instruments hold their log data as records indexed with Log Numbers starting from the most recent log, i.e. log number 1 is the most recent log.

Click on the

button to open the Data Collection Options dialog box as shown in Figure 4.

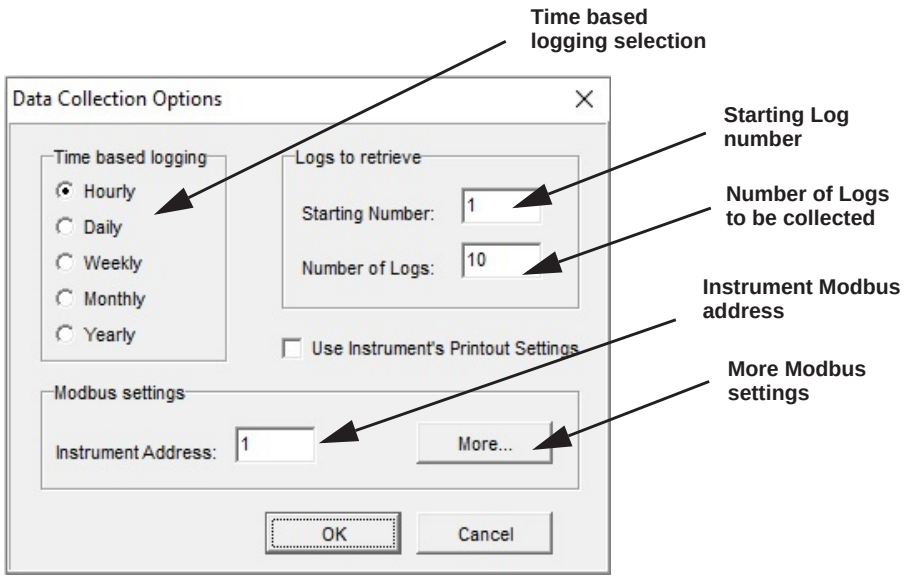


Figure 4 Data Collection Options dialog box

A number of options and selections are available to allow the data of interest to be collected from the instrument. The functions of these selections are described below.

- **Time Based Logging** - When collecting data from a 515 Flow Computer or Controller with time based logs, the type of time base of interest should be selected.[1]

- **Logs to Retrieve** - Enter the log ***Starting Number*** and ***Number of Logs*** to be collected. See **Logging Types** on page 10 for full description and examples.

- **Instrument Address** - Enter the Modbus RTU address of the instrument (range 1-247).

1. Time based selection is not applicable to 515 Batch or Load applications.

- **Use Instrument's Printout Settings** - This option can be selected so that the instrument's printout settings are used to determine the items to be included in the ***Report Data***. Alternatively, there is the ability to select or deselect the variables to be included in the ***Report Data*** by using the check boxes in the Custom Text and Tag section of the ***Report Items*** screen.

- **Modbus Settings > More...** - This button is used to gain access to additional Modbus and computer serial port settings as shown below.

Modbus and Communication Settings

The Modbus Connection Settings window is used to provide full control over the serial communication port and Modbus transaction management settings. However, it is important to note that the DataMod program default settings should suit most 515 applications.

Note, as most current computers do not have direct RS232 or RS485 ports, USB converters are often used. It must be known what COM port is used by the driver for the USB converter.

The available ***Serial Communication*** settings are shown in Figure 5.

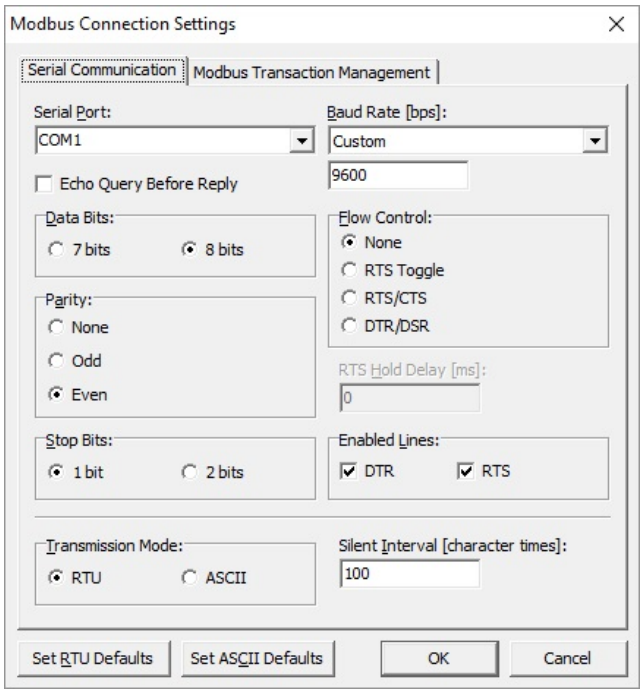


Figure 5 Modbus Connection Settings - Serial Communications

The DataMod program's Modbus transaction management default settings should suit most 515 instrument applications. However, the settings can be changed if required.

The available ***Modbus Transaction Management*** settings are shown in Figure 6.

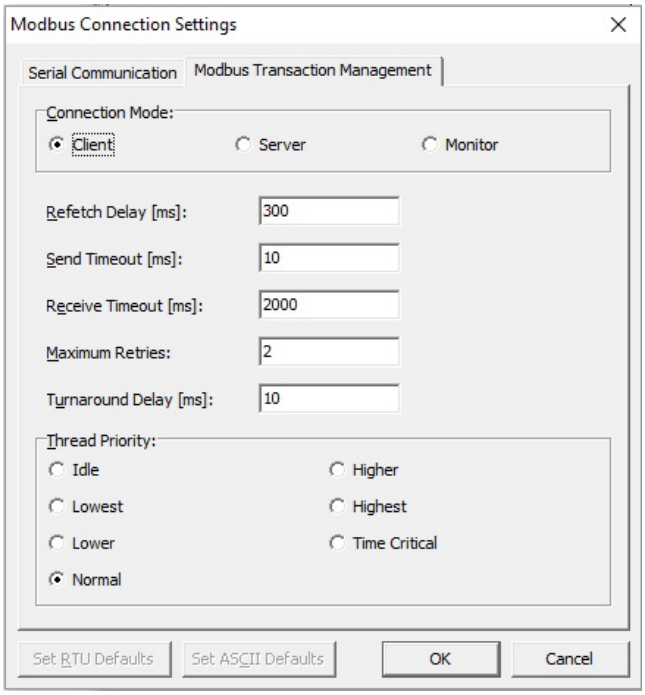


Figure 6 Modbus Connection Settings - Transaction Management

To return to the Data Collection Options dialog box, click OK to apply the settings on return, or click Cancel to return without applying any changes.

Automatic Saving of DataMod Settings

Any changes to Modbus settings or Serial Communication settings are automatically saved to be re-used the next time the DataMod program is started. The DataMod program upon restart will also automatically re-use any Custom Text and Tags file and any Custom Report Template that was previously in-use. These features greatly simplify the start-up process and access to data in instruments of a fixed system.

Start Data Collection

Click OK on the Data Collections Option dialog box to start the data collection once the hardware connection is in place with the appropriate matching communications setting on the instrument and computer.

Collecting Data

In the first stage of collecting data from the 515 instrument, the 500 DataMod program collects the instrument tags that include the variable names and the units of measure. An example of this initial stage is shown in Figure 7.

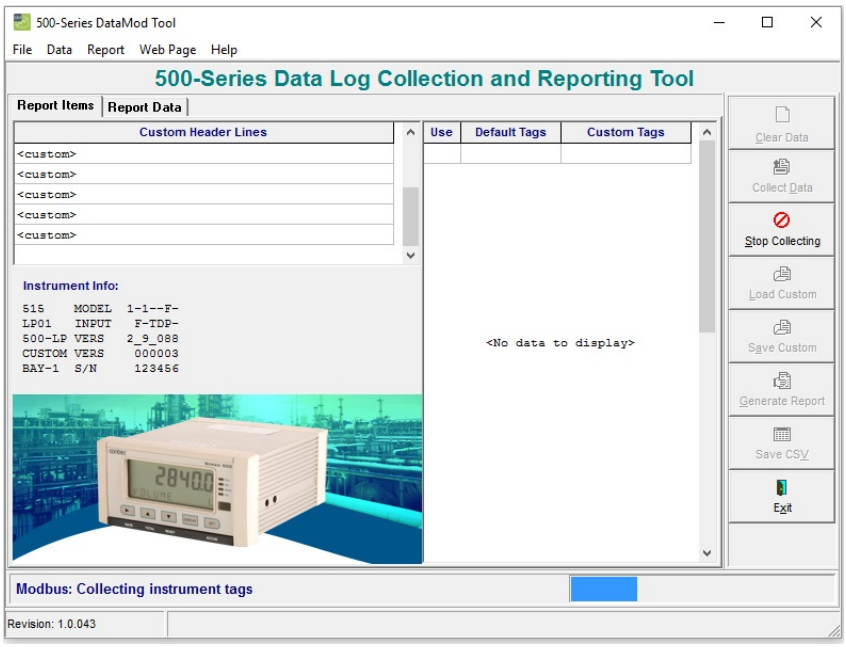


Figure 7 500 DataMod - Collecting Instrument Tags

In the second stage, after displaying a list of instrument variables, the DataMod program collects the instrument data and displays the progress as shown in Figure 8 (note that the Stop Collecting button becomes available).

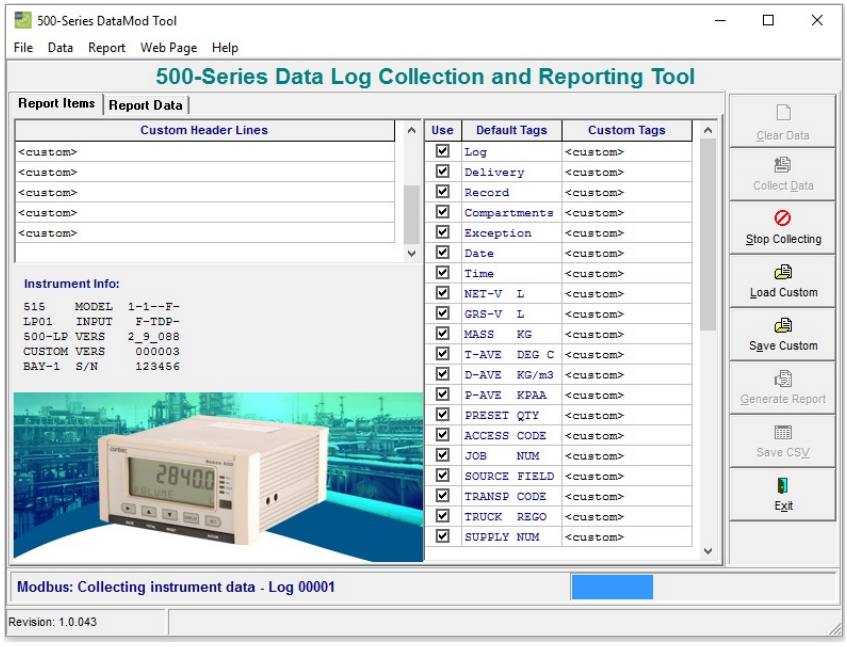


Figure 8 500 DataMod - Collecting Instrument Data

Data Collection Finished

Once the number of requested logs have been collected, the progress bar will indicate that collection has finished, the variables will be selected by default and the majority of the toolbar buttons will become available, as shown in Figure 9 (the example data has been collected from a Load application).

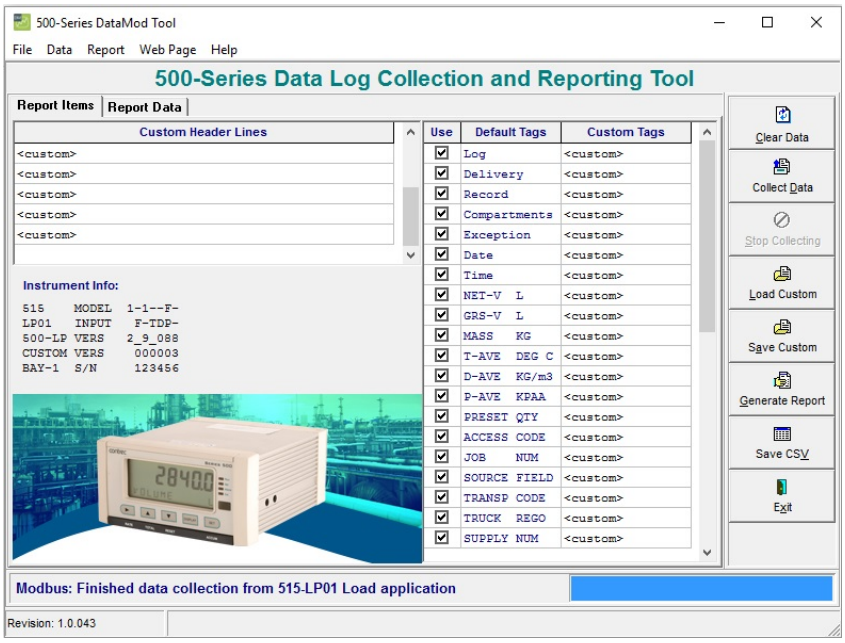


Figure 9 Report Item - Finished Data Collection (Raw Data)

The raw data can be viewed in the ***Report Data*** screen as shown in Figure 10.

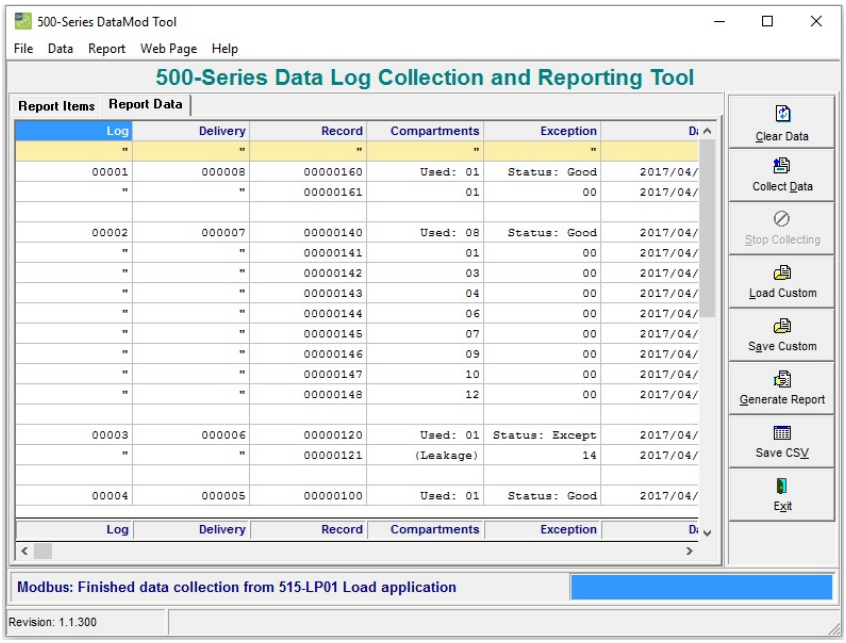


Figure 10 Report Data - Finished Data Collection (Raw Data)

Custom Text and Tags

Set Custom Text and Tags

Custom text can be entered into the ***Custom Header Lines*** and the ***Custom Tags*** as shown in Figure 9. Instrument items that are not required in the report data can be deselected using the tick boxes in the ‘Use’ column.

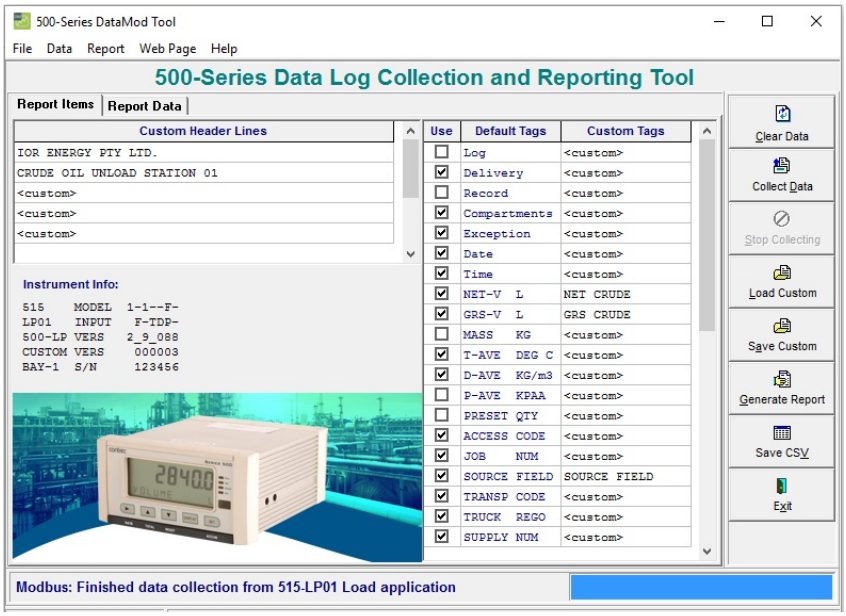


Figure 11 Report Item - Set Custom Text and Tags

The collected data can be viewed in the ***Report Data*** screen with the custom tags and selections applied as shown in Figure 12. The horizontal and vertical scroll bars can be used to view all data.

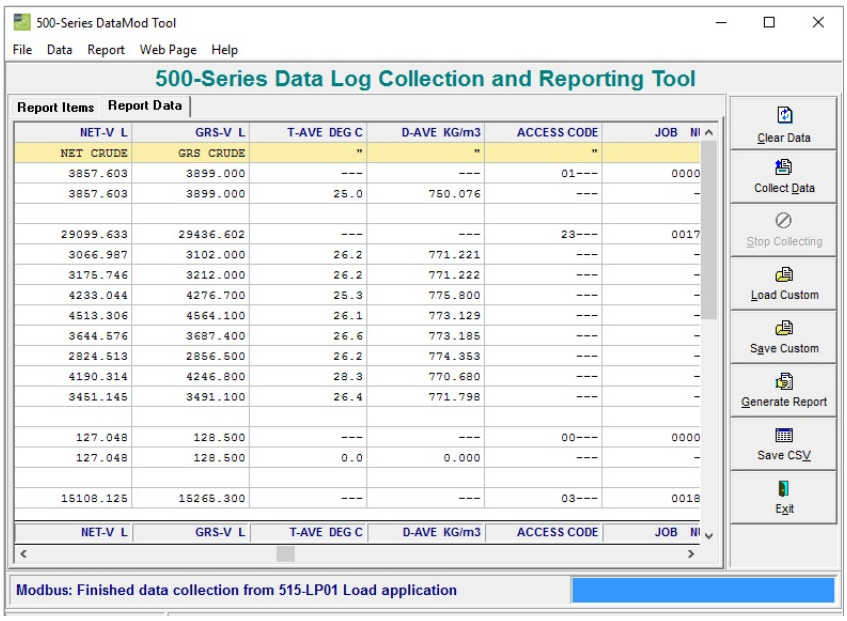


Figure 12 Report Data - View Custom Data

Save Custom Text and Tags

Saving a Custom Text and set-up file allows the same custom settings to be re-used in the future. This will save time and allow reports and saved CSV files to remain consistent.

Click on the

button to open the Save DataMod Custom Text dialog box as shown in Figure 13. Select the preferred destination folder, enter the file name and click Save to save the .dmt file.

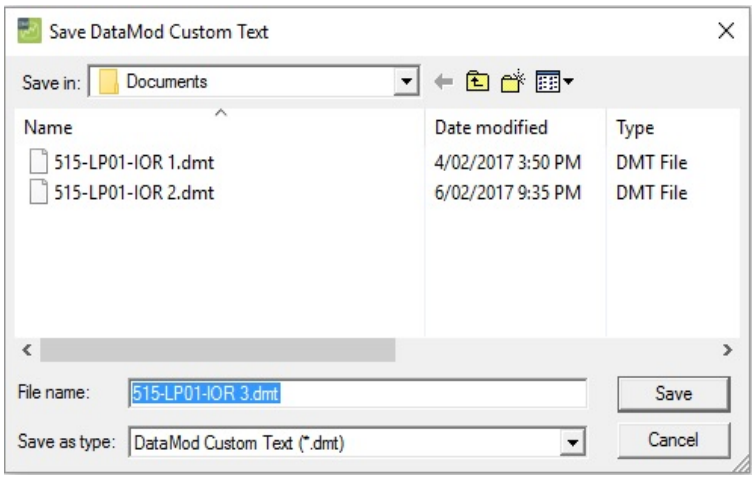
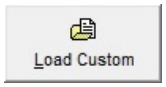


Figure 13 Save DataMod Custom Text dialog box

Load Custom Text and Tags

After raw data has been collected, as shown in Figure 9, a previously saved Custom Text and selection file can be loaded to quickly achieve a consistent report format.

Click on the 

button to open the Load DataMod Custom Text dialog box.

It is the users responsibility to only load a saved Custom Text .dmt file that matches the 515 application in the instrument. The user will not get the desired report if, for example, a .dmt file relating to 515 Gas Flow computer was loaded and applied to the data collected from a 515 Load computer. Therefore, it is a good practice to use a file name that reflects the 515 application that the Custom Text file relates to.

Select the required folder and file name and click Open to load the .dmt file to apply to the collected data as shown in Figure 14.

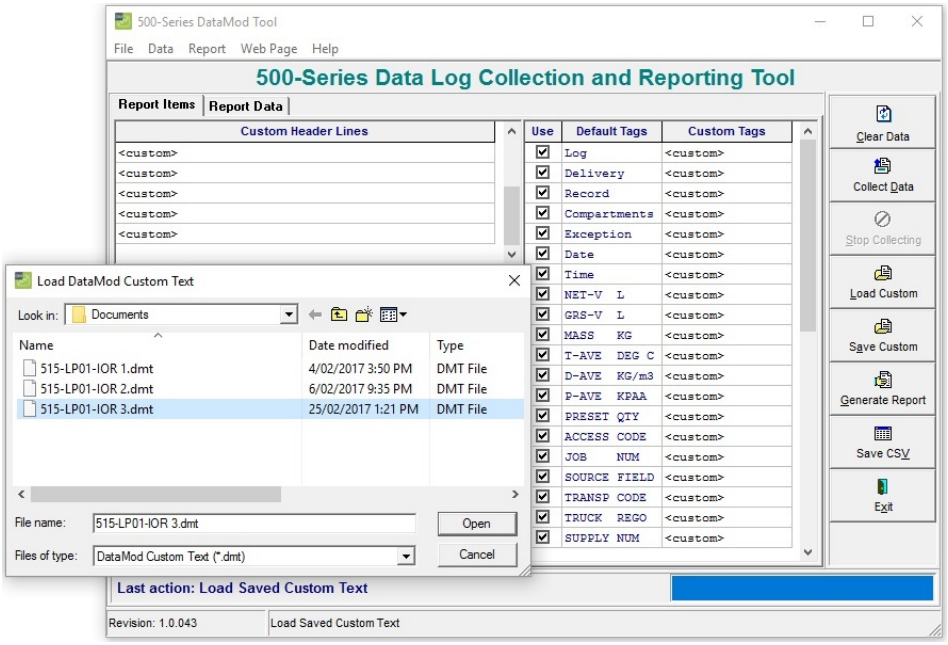


Figure 14 Load DataMod Custom Text dialog box

When the custom text file is loaded, the settings are applied to the collected data as shown in the example in Figure 15.

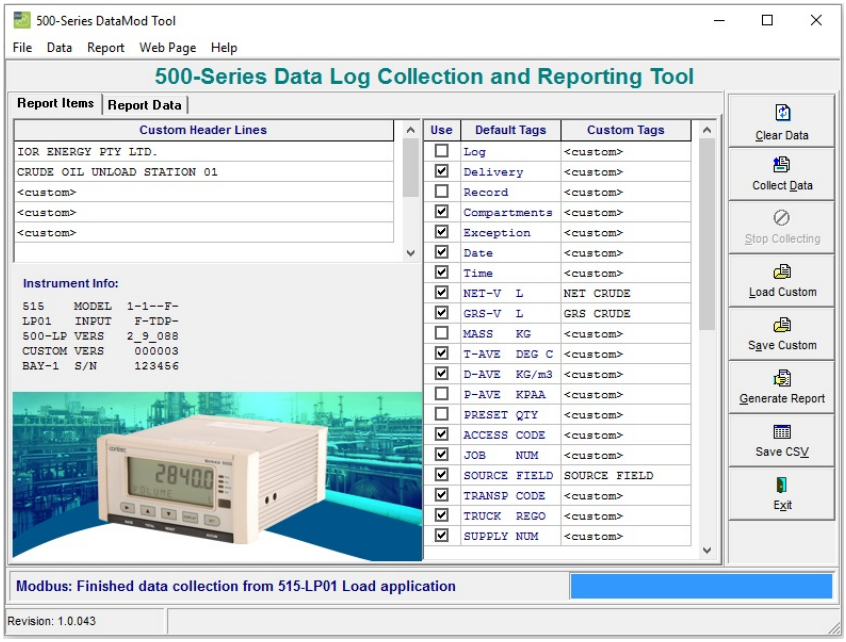


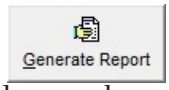
Figure 15 Report Item - Custom Text and Tags Loaded

Note: Any custom settings (entered by the user or loaded from a .dmt file) will remain until the Clear Data button is used. The DataMod program can be closed and re-opened and the data can be collected again from the instrument and the custom text and settings will still apply.

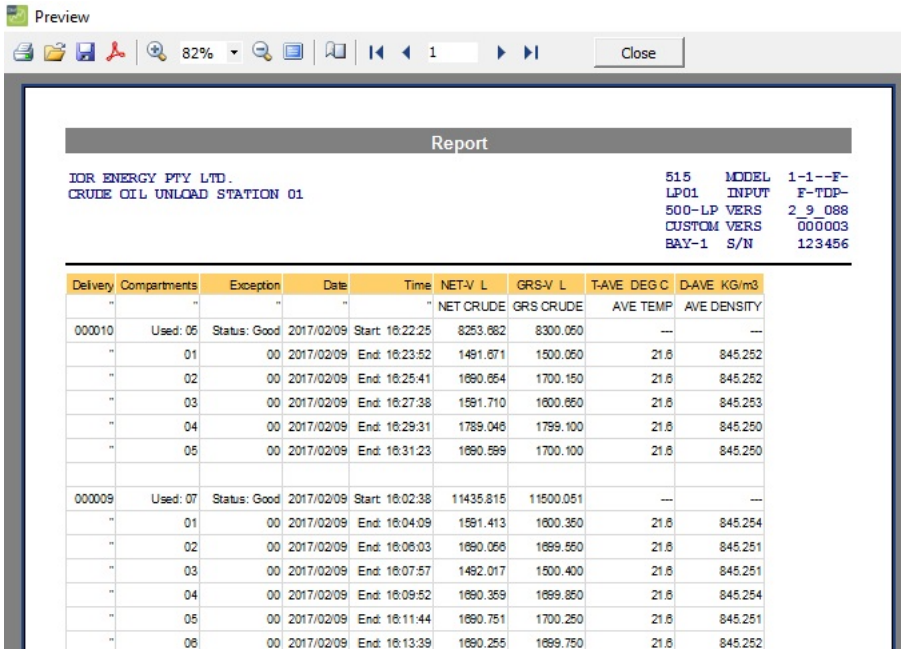
DataMod Reports

Generate Report

After data has been collected and any desired custom text and selections have been applied, a report can be generated.

Click on the 

button to view the collected data in the report preview window as shown in Figure 16.



Delivery	Compartments	Exception	Date	Time	NET-V L	GRS-V L	T-AVE DEG C	D-AVE KG/m3
"	"	"	"	"	NET CRUDE	GRS CRUDE	AVE TEMP	AVE DENSITY
000010	Used: 05	Status: Good	2017/02/09	Start: 16:22:25	8253.682	8300.050	---	---
"	01	00	2017/02/09	End: 16:23:52	1491.671	1500.050	21.6	845.252
"	02	00	2017/02/09	End: 16:25:41	1690.654	1700.150	21.6	845.252
"	03	00	2017/02/09	End: 16:27:38	1591.710	1600.650	21.6	845.253
"	04	00	2017/02/09	End: 16:29:31	1789.046	1799.100	21.6	845.250
"	05	00	2017/02/09	End: 16:31:23	1690.599	1700.100	21.6	845.250
000009	Used: 07	Status: Good	2017/02/09	Start: 16:02:38	11435.815	11500.051	---	---
"	01	00	2017/02/09	End: 16:04:09	1591.413	1600.350	21.6	845.254
"	02	00	2017/02/09	End: 16:06:03	1690.056	1699.550	21.6	845.251
"	03	00	2017/02/09	End: 16:07:57	1492.017	1500.400	21.6	845.251
"	04	00	2017/02/09	End: 16:09:52	1690.359	1699.850	21.6	845.254
"	05	00	2017/02/09	End: 16:11:44	1690.751	1700.250	21.6	845.251
"	06	00	2017/02/09	End: 16:13:39	1690.255	1699.750	21.6	845.252

Figure 16 DataMod Report Preview - Single page

In the report Preview window the following options are available:

- **PRINT** - Open the standard print dialog box.
- **OPEN** - Open a previously saved .fp3 prepared report file.
- **SAVE** - Save the report in .fp3 prepared report format for future use.
- **EXPORT AS PDF** - Save the report in PDF format.
- **CHANGE VIEW** - Zoom in or out or use forward/reverse arrows to view other pages.

The Report is generated in A4 portrait format. If the number of variables in the report do not fit across a single A4 page, the report will continue to become two (or more) pages wide, as shown in Figure 17.

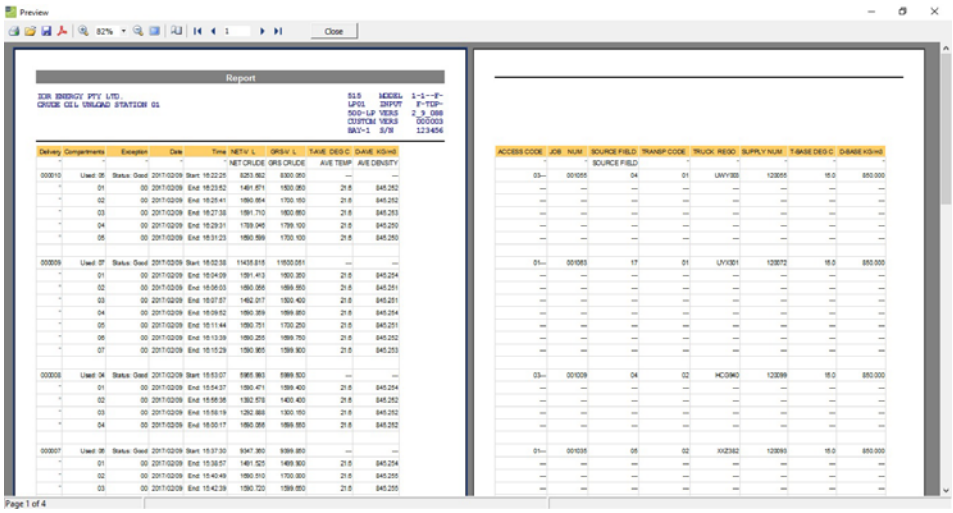


Figure 17 DataMod Report Preview - Double page

Save Report as CSV

After data has been collected and any desired custom text and selections have been applied, a report can be saved in CSV format for future use.

Click on the

button to open the Save Data in CSV Format dialog box as shown in Figure 18. Select the preferred destination folder, enter the file name and click Save to save the .csv file.

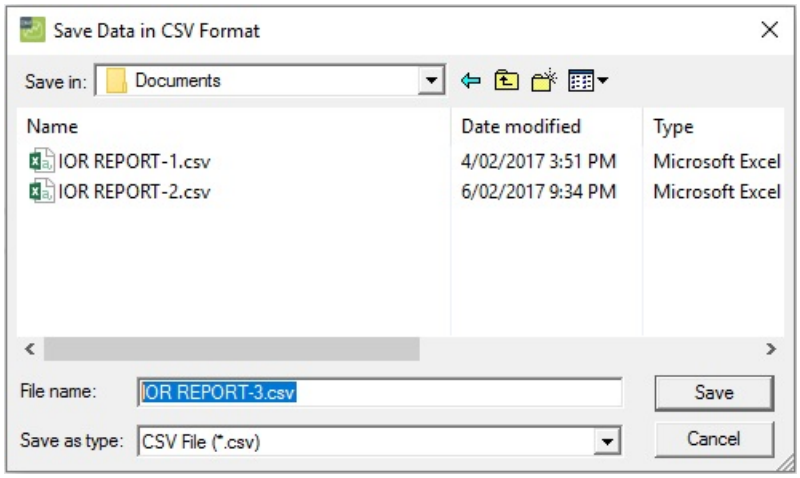
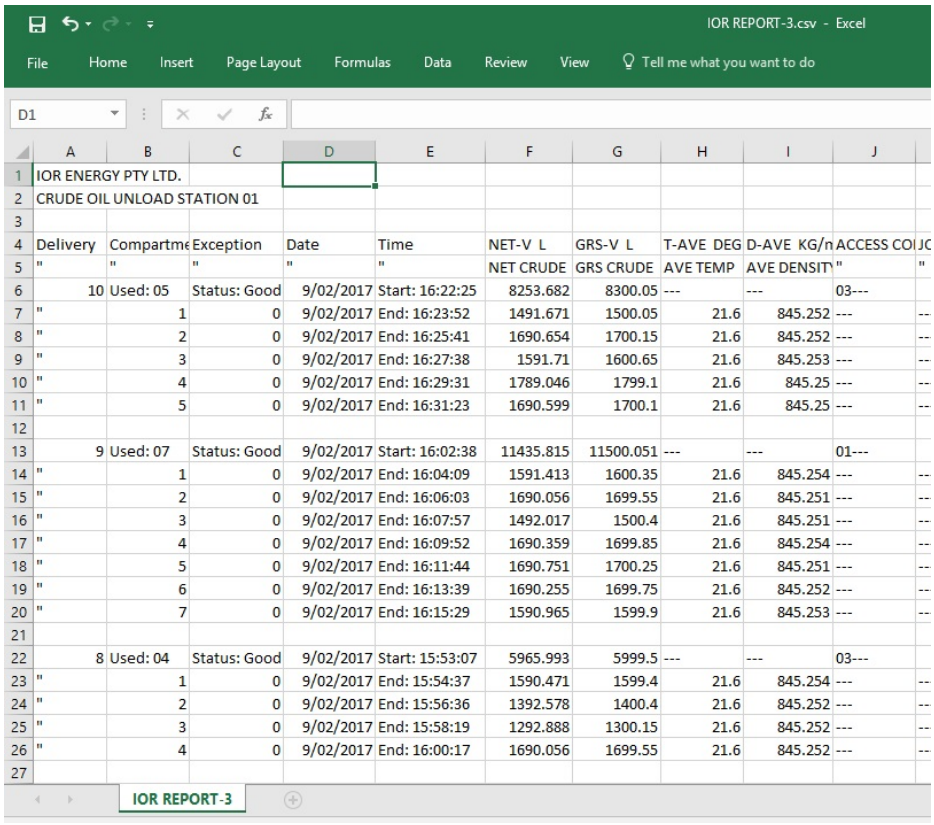


Figure 18 Save Data in CSV Format dialog box

A CSV file can be imported into many applications. It can also be opened and viewed in spreadsheet programs such as Excel where the data can be sorted and re-arranged as needed. An example of a DataMod CSV file opened in Excel is shown in Figure 19.



	A	B	C	D	E	F	G	H	I	J
1	IOR ENERGY PTY LTD.									
2	CRUDE OIL UNLOAD STATION 01									
3										
4	Delivery	Compartme	Exception	Date	Time	NET-V L	GRS-V L	T-AVE DEG	D-AVE KG/n	ACCESS CO
5	"	"	"	"	"	NET CRUDE	GRS CRUDE	AVE TEMP	AVE DENSIT	"
6	10	Used: 05	Status: Good	9/02/2017	Start: 16:22:25	8253.682	8300.05	---	---	03---
7	"	1	0	9/02/2017	End: 16:23:52	1491.671	1500.05	21.6	845.252	---
8	"	2	0	9/02/2017	End: 16:25:41	1690.654	1700.15	21.6	845.252	---
9	"	3	0	9/02/2017	End: 16:27:38	1591.71	1600.65	21.6	845.253	---
10	"	4	0	9/02/2017	End: 16:29:31	1789.046	1799.1	21.6	845.25	---
11	"	5	0	9/02/2017	End: 16:31:23	1690.599	1700.1	21.6	845.25	---
12										
13	9	Used: 07	Status: Good	9/02/2017	Start: 16:02:38	11435.815	11500.051	---	---	01---
14	"	1	0	9/02/2017	End: 16:04:09	1591.413	1600.35	21.6	845.254	---
15	"	2	0	9/02/2017	End: 16:06:03	1690.056	1699.55	21.6	845.251	---
16	"	3	0	9/02/2017	End: 16:07:57	1492.017	1500.4	21.6	845.251	---
17	"	4	0	9/02/2017	End: 16:09:52	1690.359	1699.85	21.6	845.254	---
18	"	5	0	9/02/2017	End: 16:11:44	1690.751	1700.25	21.6	845.251	---
19	"	6	0	9/02/2017	End: 16:13:39	1690.255	1699.75	21.6	845.252	---
20	"	7	0	9/02/2017	End: 16:15:29	1590.965	1599.9	21.6	845.253	---
21										
22	8	Used: 04	Status: Good	9/02/2017	Start: 15:53:07	5965.993	5999.5	---	---	03---
23	"	1	0	9/02/2017	End: 15:54:37	1590.471	1599.4	21.6	845.254	---
24	"	2	0	9/02/2017	End: 15:56:36	1392.578	1400.4	21.6	845.252	---
25	"	3	0	9/02/2017	End: 15:58:19	1292.888	1300.15	21.6	845.252	---
26	"	4	0	9/02/2017	End: 16:00:17	1690.056	1699.55	21.6	845.252	---
27										

Figure 19 Example of CSV file Opened in Excel

Load a Custom Report Template

Some users of the 500 DataMod tool may desire to go beyond the generic layout of the standard report in order to meet their specific requirements. In these situations, Contrec can be contacted to arrange for the purchase of a custom Report Template designed to suit such requirements.

After adequate details of the required report have been provided, a .fr3 Report Template will be supplied. Use the Report Menu to select the Load Template option as shown in Figure 20.

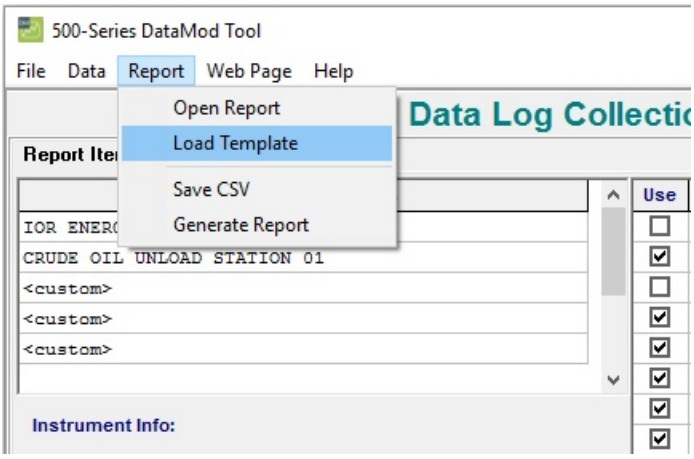


Figure 20 500 DataMod Report Menu - Load Template

The Load Report Template dialog box will open as shown in Figure 21. Select the appropriate folder and .fr3 report template file. This template will then be applied when the Generate Report function is used.

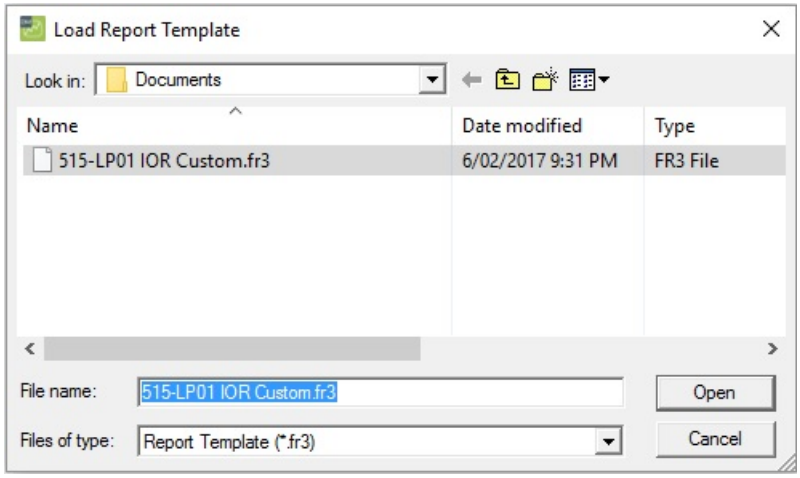


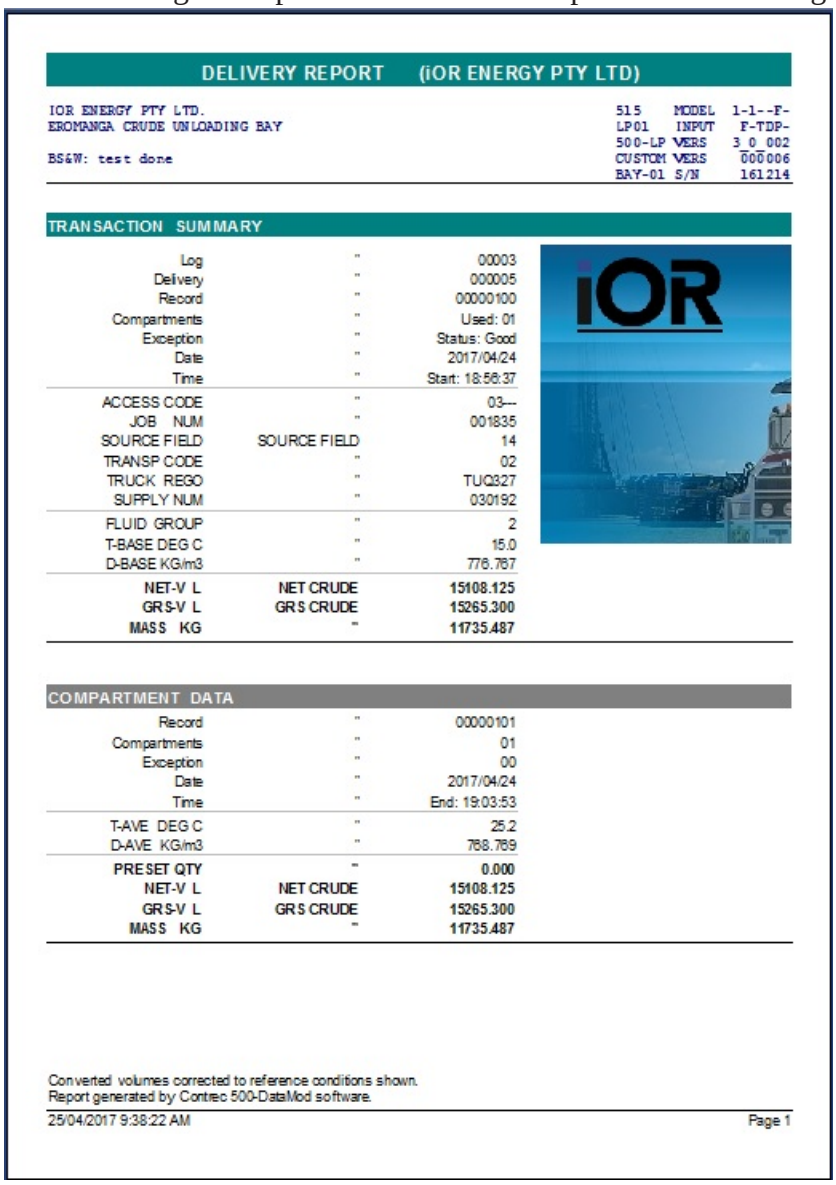
Figure 21 Load Report Template dialog box

Samples of Custom Reports

Once a Custom Report Template has been loaded, that template will be used each time the Generate Report button is used. A custom report can include a specific report heading, company logo and graphics, site or installation details and specific layout and content as required. Below are examples of a custom report created to suit a 515 LP01 Unload application. This custom report is suited to single or multi compartment transactions.

Single Compartment Transaction Report

A custom single compartment transaction report is shown in Figure 22.



DELIVERY REPORT (iOR ENERGY PTY LTD)

IOR ENERGY PTY LTD.
EROMANGA CRUDE UNLOADING BAY

BS&W: test done

515 MODEL 1-1--F-
LP01 INPUT F-TDP-
500-LP VERS 3_0_002
CUSTOM VERS 000006
BAY-01 S/N 161214

TRANSACTION SUMMARY

Log	"	00003
Delivery	"	000005
Record	"	00000100
Compartments	"	Used: 01
Exception	"	Status: Good
Date	"	2017/04/24
Time	"	Start: 18:56:37
ACCESS CODE	"	03---
JOB NUM	"	001835
SOURCE FIELD	SOURCE FIELD	14
TRANSP CODE	"	02
TRUCK REGO	"	TUQ327
SUPPLY NUM	"	030192
FLUID GROUP	"	2
T-BASE DEG C	"	15.0
D-BASE KG/m3	"	776.767
NET-V L	**NET CRUDE**	**15108.125**
GRS-V L	**GRS CRUDE**	**15265.300**
MASS KG	"	**11735.487**

COMPARTMENT DATA

Record	"	00000101
Compartments	"	01
Exception	"	00
Date	"	2017/04/24
Time	"	End: 19:03:53
T-AVE DEG C	"	25.2
D-AVE KG/m3	"	768.769
PRESET QTY	"	**0.000**
NET-V L	**NET CRUDE**	**15108.125**
GRS-V L	**GRS CRUDE**	**15265.300**
MASS KG	"	**11735.487**

Converted volumes corrected to reference conditions shown.
Report generated by Contrec 500-DataMod software.

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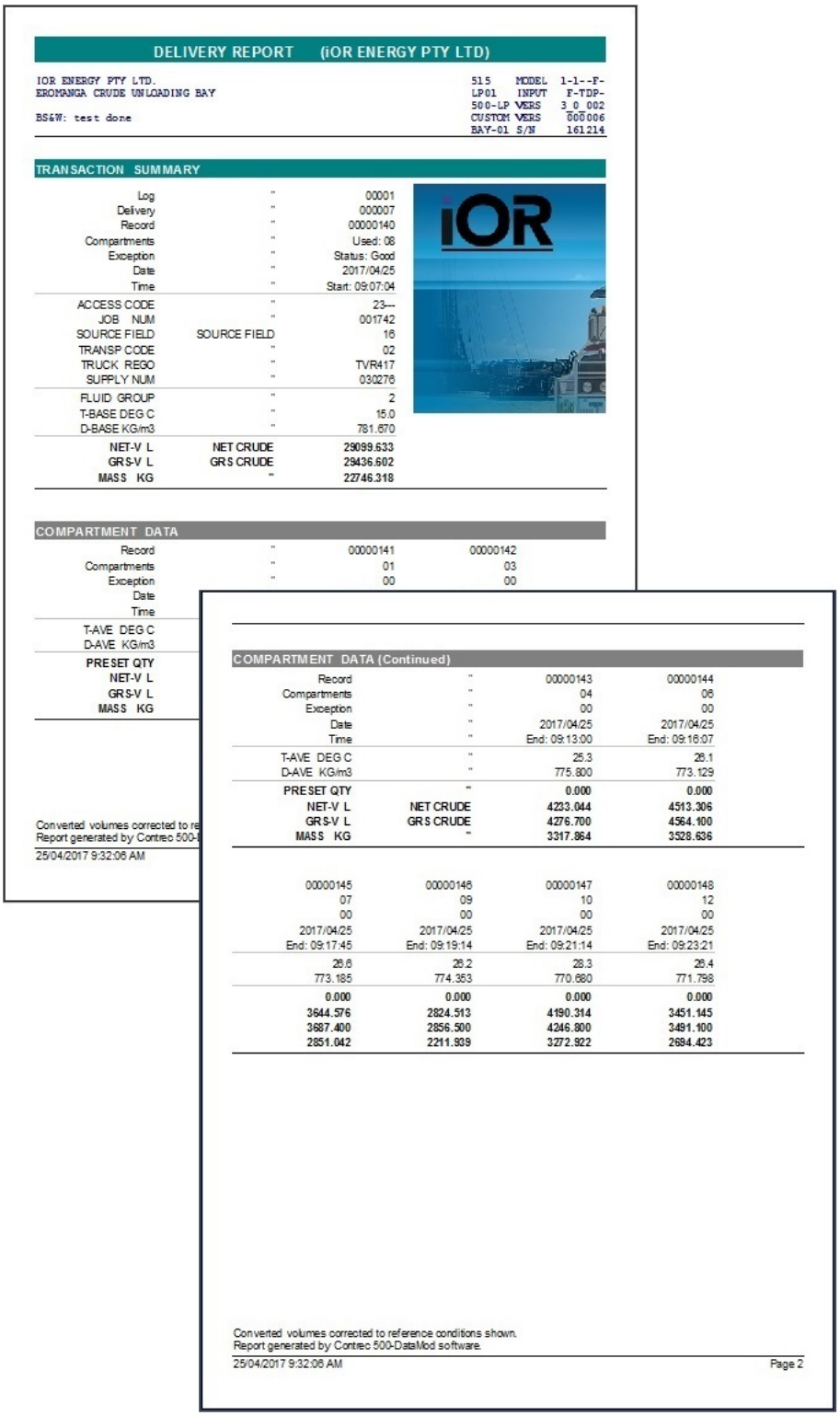
Figure 22 Single Compartment Transaction Report

Multiple Compartment Transaction Report

A custom multiple compartment transaction report is shown in Figure 23.



DELIVERY REPORT (iOR ENERGY PTY LTD)

IOR ENERGY PTY LTD.
EROMANGA CRUDE UNLOADING BAY

BS&W: test done

515 MODEL 1-1--F-
LP01 INPUT F-TDP-
500-LP VERS 3_0_002
CUSTOM VERS 000006
BAY-01 S/N 161214

TRANSACTION SUMMARY

Log	"	00001
Delivery	"	000007
Record	"	00000140
Compartments	"	Used: 08
Exception	"	Status: Good
Date	"	2017/04/25
Time	"	Start: 09:07:04
ACCESS CODE	"	23---
JOB NUM	"	001742
SOURCE FIELD	SOURCE FIELD	16
TRANSP CODE	"	02
TRUCK REGO	"	TVR417
SUPPLY NUM	"	030276
FLUID GROUP	"	2
T-BASE DEG C	"	15.0
D-BASE KG/m3	"	781.670
NET-V L	NET CRUDE	29099.633
GRS-V L	GRS CRUDE	29436.602
MASS KG	"	22746.318

COMPARTMENT DATA

Record	"	00000141	00000142
Compartments	"	01	03
Exception	"	00	00
Date			
Time			
T-AVE DEG C			
D-AVE KG/m3			
PRESET QTY			
NET-V L			
GRS-V L			
MASS KG			

Converted volumes corrected to re
Report generated by Contrec 500-
25/04/2017 9:32:06 AM

COMPARTMENT DATA (Continued)

Record	"	00000143	00000144
Compartments	"	04	06
Exception	"	00	00
Date	"	2017/04/25	2017/04/25
Time	"	End: 09:13:00	End: 09:16:07
T-AVE DEG C	"	25.3	26.1
D-AVE KG/m3	"	775.800	773.129
PRESET QTY	"	0.000	0.000
NET-V L	NET CRUDE	4233.044	4513.306
GRS-V L	GRS CRUDE	4276.700	4564.100
MASS KG	"	3317.864	3528.636

00000145	00000146	00000147	00000148
07	09	10	12
00	00	00	00
2017/04/25	2017/04/25	2017/04/25	2017/04/25
End: 09:17:45	End: 09:19:14	End: 09:21:14	End: 09:23:21
26.6	26.2	28.3	26.4
773.185	774.353	770.680	771.798
0.000	0.000	0.000	0.000
3644.576	2824.513	4190.314	3451.145
3687.400	2856.500	4246.800	3491.100
2851.042	2211.939	3272.922	2684.423

Converted volumes corrected to reference conditions shown.
Report generated by Contrec 500-DataMod software.
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Figure 23 Multiple Compartment Transaction Report