

500 DataMod Tool

User Guide



500 DataMod Tool - User Guide

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Chapter 1

Introduction

Welcome to 500-Series DataMod Tool

ATTENTION: Please note that, starting from the version 1.4.000, DataMod tool provides a convenient **Load/Save Configuration Records** and **Polling** feature which significantly simplifies collecting data and generating reports from multiple 500-Series field instruments.

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 live or logged data from 515-Series instruments
- Display collected process data
- Stored Configuration Records hold all the settings specific to a field instrument
- Easy loading and saving of the configuration records
- Simple operator process to collect data from multiple field instruments
- Generate PDF reports (with option of auto-save and auto-print of PDF reports)
- Instant access to the last auto report
- Produce data in CSV format commonly used in 3rd party software
- Customisable reports (special custom templates also available)
- Modbus RTU communication via serial port or TCP/IP (IoT solutions)
- Monitor single or multiple event based controllers to auto-collect live transactions
- Easy access to an instrument's Modbus accessible parameters
- Access to update/maintain a load controller's Authorisation ID-Codes and table of Compartment Load Values
- Specify start and end numbers for transaction records collection
- Confidence in data integrity
- Send email alert if live or auto data collecting is aborted
- No need for Modbus map configuration (mapping of registers)

The tool is simple to use and data is easy to collect. The program allows multiple custom configurations to be quickly saved and reloaded for the easy data collection from multiple field instruments. It also automatically restarts with the previous configuration and allows saved reports to be re-opened.

1. The DataMod tool is compatible with 515 instruments with software versions starting from 2.9.080 (or 3.0.389 if Load application and auto-collecting is required).

System Requirements

The 500-Series DataMod Tool has the following system requirements:¹

- Windows based Personal Computer
- 256MB Memory (or higher), and 10MB available Hard Disk space
- Display Resolution 1024 x 768 minimum
- Serial Communications Port or TCP/IP connection (the 515 instruments can be supplied with the option of an Ethernet port)
- Microsoft Windows 7 (or higher), normal DPI setting
- PDF Reader, such as Adobe Acrobat Reader V4.0 or higher (to view/print generated reports)
- Internet access for periodic software verification and email alerts

User Licence

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

An installation of the trial version of the DataMod software can be changed to a fully licenced installation with the entry of an activation code or by requesting to update an existing trial version after paying for the full licence.

A single licence allows the 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.

1. It is not possible to have multiple DataMod applications open on the same device.

Hardware Connection

The 515 Series instruments use industry standard Modbus RTU protocol. The DataMod program offers a selection of Modbus transmission modes that can be used from a Windows based computer. Selections can be: **RTU Serial** (for direct local connection), **TCP/IP** or **RTU over TCP/IP** (for Internet or Ethernet based solution for remote access to a 515 unit with the 515ETH Ethernet option card fitted or a serial to TCP/IP converter at the 515 instrument side).

In any case, to use the DataMod program there must be a transparent and robust serial communication connection between the instrument and the computer running DataMod. Settings of a Modbus serial-to-TCP converter should match the serial port settings of 515 instrument, and the selection of transmission mode of **TCP/IP** or **RTU over TCP/IP** in the DataMod program.

515 Instrument Connection

The 515 instrument has a RS232 serial port and a RS485 serial port, with newer models providing the option of an Ethernet port in place of the RS485. A serial port can have the Modbus RTU protocol assigned to it and both serial 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, and 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 can be 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.

The Ethernet port would be used when communication is to be via TCP/IP or 'RTU over TCP/IP' protocol over a Local Area Network to a computer or over a Virtual Private Network (VPN) for remote applications.

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 DataMod program allows the user to select the appropriate serial port or TCP/IP connection on the computer. For the serial port, it 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 515 instrument settings). For TCP/IP connections, it allows entry of the port and host name / IP address.

The program also provides the option of sending an Email Alert if live or auto data collecting is unexpectedly aborted. Refer to [Email Alert Option](#) on page 29.

DataMod Basics

Starting DataMod

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



Figure 1 500-Series DataMod Welcome Screen

The main screen of the DataMod program is shown in Figure 2. The current **Configuration** title is shown along the top, the Information and Progress bar is displayed along the bottom, the three main viewing control tabs (**Configurations List**, **Report Items** and **Report Data**) are located in the upper left, the Menu Bar is along the top and the main Toolbar is found on the right hand side.

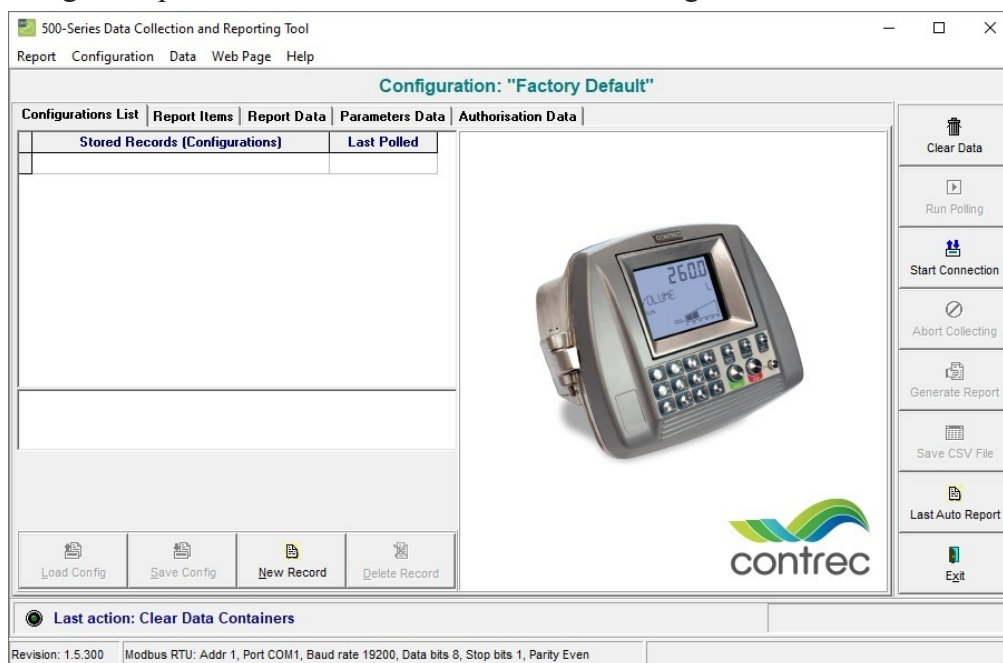


Figure 2 500-Series DataMod Main Screen

Main Screen Overview

This section provides an overview of key parts and features of the main DataMod screen.

Current Configuration Title - This banner is used to identify the configuration record that is currently in use. A configuration record contains all the settings, custom text/tags and template that may be required for communication, data collection and report generation for a specific field instrument. For more detail, refer to [DataMod Configuration Records](#) on page 7.

Information and Progress Bar - This section provides feedback regarding the current program status or the previous action carried out. The coloured flashing ‘lamp’ and messages provide clear and helpful information. The very bottom line of the main screen provides information about the software version on left, current communication settings in the centre and an area reserved on the right for displaying hints relating to buttons and features as the cursor moves over them.

Configurations List - This screen contains the list of Configurations that have been created and saved to allow the efficient and simple reloading of a previously created configuration. From this screen Configuration records can be created, loaded, saved or deleted. For more detail, refer to [Configurations List](#) on page 7.

Report Items - This screen will become populated after some initial communication connection has been established and data has been collected from a 500-Series instrument. For more detail, refer to [Report Items Screen](#) on page 8.

Report Data - This screen will become populated after some initial communication connection has been established and data has been collected from a 500-Series instrument. For more detail, refer to [Report Data Screen](#) on page 9.

Parameters Data - This screen provides the ability to read and write to the 500-Series instrument’s Modbus accessible parameters. For more detail, refer to [Parameters Data Screen](#) on page 9.

Authorisation Data - This screen provides ability to read and write the authorisation ID codes in a Load Computer or Secure Batch Controller and the Compartment Load Values in a Load Computer. For more detail, refer to [Authorisation Data Screen](#) on page 10.

Menu Bar - The Menu Bar along the top is of a standard format and provides access to the programs features and settings. For full listing and detail, refer to [Menu Bar](#) on page 11.

Main Toolbar - The Main Toolbar down the right hand side gives quick and direct access to the key functions of DataMod that are listed in an order that reflects the general sequence of a selection, connection, collection and report generation process. For full listing and detail, refer to [DataMod Toolbar](#) on page 13.

DataMod Configuration Records

A configuration record contains all the settings and custom text and tags that may be required for communication, data collection and report generation for a specific field instrument. The **Configurations List** tab displays a screen which allows configuration records to be managed, i.e. they can be created, loaded, saved or deleted.

The configuration in use is displayed in the current 'Configuration' title along the top of the main screen. Initially DataMod will hold the 'Factory Default' as the current configuration, but by using the Data Collection and Modbus Options dialog boxes the configuration can start to be tailored to suit a particular field instrument. Green text will indicate that the configuration in use is as per the original loaded record, while red text will indicate that configuration has been modified and can be saved/updated or a new configuration created to be re-used at a later time.

Configurations List

The ability to use the **Configurations List** to create and store multiple configuration records significantly simplifies the process of data collection from different field instruments.

An example of the **Configuration List** tab is shown in Figure 3.

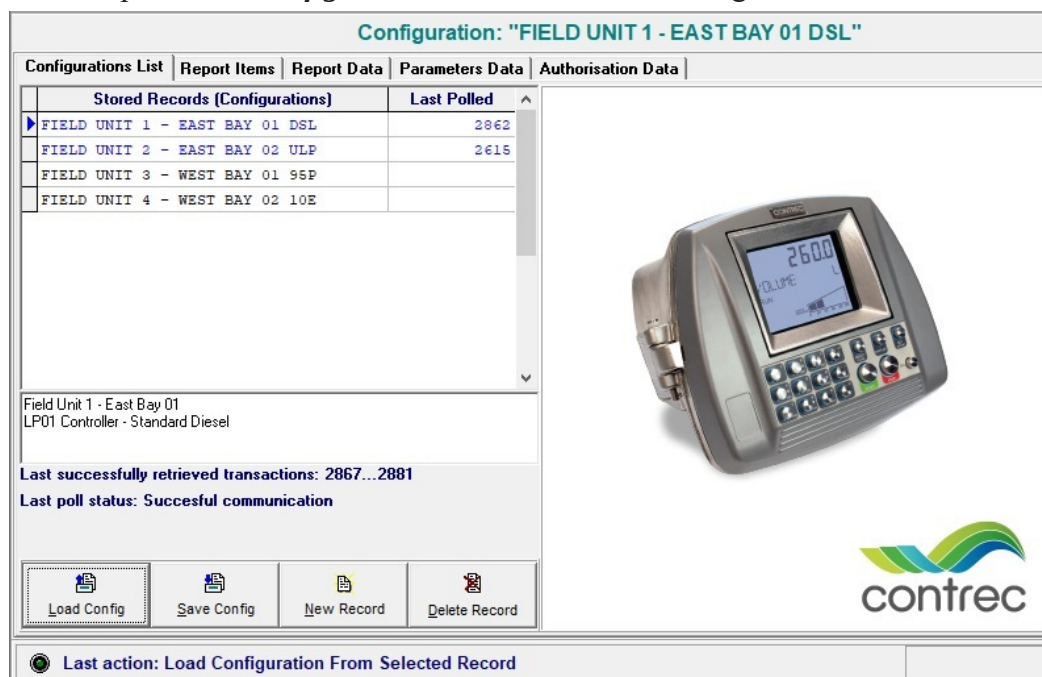


Figure 3 DataMod Configurations List tab

The **Configurations List** tab also includes information relating to the last actions specific to the data collection from a field instrument. In particular for those batch, load or event based applications, the **Last Polled**, **Last successfully retrieved transactions** and **Last poll status** are displayed for quick reference. Configurations shown in coloured text are those that have been selected to be included in the Polling List to be automatically collected when a transaction is completed.

The buttons along the bottom provide the following functions:

- **Load Config** - Load the configuration from the selected record.
- **Save Config** - Save the current configuration into the selected record.
- **New Record** - Create a new record from the current configuration settings.
- **Delete Record** - Delete the selected record.

NOTE: The list of Stored Records is shown in Alpha-numerical order of titles. Record titles can be easily edited to suit the desired order.

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 communication connection has been established and the instrument type and main menu list has been identified.
- **Data** - This column shows the last set of data collected from the instrument.
- **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 and DataMod entries including:
 - Hardware model information
 - Application pack and input usage
 - Application firmware version used to create application
 - Custom version number
 - Instrument name and serial number.
 - Unit Tag

This information is included into reports, also serial number and unit tag form a part of the auto-report file name.
- **Application Type** - This identifies the type of application that is currently selected. The Application Type is selected in the Data Collection Options and can be of the types: General, Load, Batch or Access.

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 measurement (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.

Parameters Data Screen

The **Parameters Data** tab displays a screen that provides access to the instrument's Modbus accessible parameters. The list of available parameters are as shown in the Modbus Protocol - List of Data Registers section of the relevant 500-Series or LoadPro instrument manual. The accessible parameters and their name/role are found in the register block 51 to 99. The Parameter Data list in DataMod are accessed in the same order as the items shown in the relevant instrument's manual.

The **Parameters Data** tab displays a screen with the following key features:

- Numbered items 1 to 24, aligning with the instrument's Modbus registers 51 to 99.
- Name of parameter, independently entered as required and saved as part of a stored configuration.
- Value of the parameter as either freely entered to be written to the instrument or as read back from the instrument and can be saved as part of a stored configuration.

An example of the **Parameters Data** tab is shown in Figure 4.

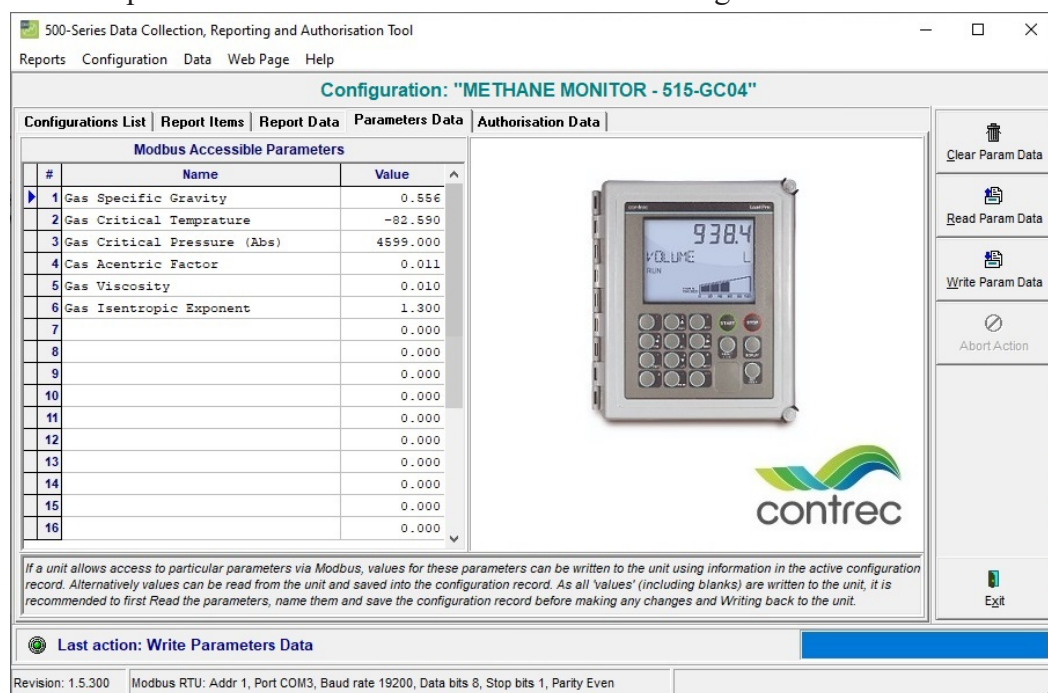


Figure 4 DataMod Parameters Data tab

Parameters Data tab button functions include:

- **Clear Param Data** - Clears all the Name and Value fields in the displayed table (does not clear any data in the instrument).
- **Read Param Data** - Reads the full block of accessible parameter data found in the instrument's Modbus register block 51 to 99. Reads values only (an item Name is only user entered text held in DataMod).
- **Write Param Data** - Writes the full block of 24 values to the accessible parameter data found in the instrument's Modbus register block 51 to 99 **IMPORTANT** - it is highly recommended to first READ the data from the instrument to populate the data values with valid information before making any required changes and writing back, this is to ensure other items in the parameter block are not accidentally cleared. Although not all items in the 'parameter block' may be used, note that blank 'values' are written as zero and will clear data in that item.
- **Abort Action** - Aborts the Read or Write that may be in progress.

To keep an accurate record of the instrument's DataMod parameter data, remember to save any required changes in to the Configuration Record.

Authorisation Data Screen

The **Authorisation Data** tab displays a screen that provides ability to read and write the authorisation ID codes in a Load Computer or Secure Batch Controller and provides the ability to read and write the Compartment Load Values into a Load Computer.

Operation of Load Computers often requires operator and/or truck authorisation. This data can be written to the unit using entered data in the active configuration record. Alternatively data can be read from the unit and saved into the configuration record. Authorisation 2 has associated Compartment Load Values (also serving as a maximum preset quantity) for the first 10 IDs.

In a LoadPro load computer the access is to the 100 x ID-1 and 100 x ID-2 authorisation and identification codes as well as the multi compartment load values. In a 515 Secure Batcher only the ID-1 set of codes can be used and are accessible.

For full description of the Authorisation Data screen, refer to **Authorisation Data** on page 49.

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
Report	Save CSV file	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.
	Open Saved Report	Open a previously saved report in the Preview screen.
	Open Last Auto Report	Open the last automatically generated PDF report.
	Exit	Exit the DataMod program.
Configuration	Modbus	Open the Modbus Connection Settings dialog box.
	Email Alert	Open Email Alert Option dialog box.
	Collection Options	Open the Data Collection Options dialog box.
	Report Template	Load a custom report template created and supplied by Contrec (contact your distributor for details).
	Load Config	Load a configuration from the selected record.
	Save Config	Save the current configuration into the selected record.
	New Record	Create a new record from the current configuration.
	Delete Record	Delete the selected record.

Table 1 500 DataMod Menu

Menu	Sub Item	Function
Data	Clear Data	Clear any custom text and any data previously collected.
	Run Polling	Start polling multiple instruments (those included in the 'Polling List').
	Start Connection*	Open the dialog box to start instrument connection process.
	Start Collecting*	Start the data collection process. (* Start Collecting replaces the Start Connection menu item after connection is established.)
	Abort Collecting	Abort collecting data from the instrument(s).
Web Page		If internet connection is available, the Contrec website is opened using the computer's default browser.
Help	User Guide	Open the 500 DataMod Tool User Guide (this document) in the computer's default PDF reader.
	About	Display the version details of the DataMod program.

Table 1 500 DataMod Menu

DataMod Toolbar

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

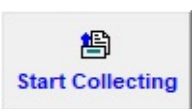
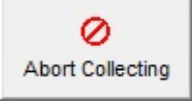
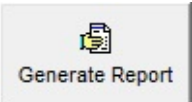
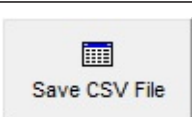
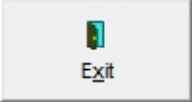
Option	Toolbar Button	Description
Clear Data		Clear any previous data that has been collected. Also clears any custom text and any custom variable selections.
Run Polling		Start polling multiple instruments. Note: 'Polling List' configurations are highlighted by coloured text in the Configurations List.
Start Connection		Open the Data Collection Options dialog box to start the connection process. The instrument will be identified and the Report Items screen will be populated with the instrument info and the main menu items.
Start Collecting		Collect data from the instrument. The button text flashes blue to indicate the DataMod program is connected and ready to proceed.
Abort Collecting		Allow the data collection process to be aborted. The data collected prior to stopping the process is retained.
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.
Last Auto Report		Open the last automatically generated PDF report in the computer's default PDF reader.
Exit		Exit the DataMod program.

Table 2 500 DataMod Toolbar Buttons

Chapter 2

Operation

DataMod Quick Guide

The tables below briefly outline example procedures for using the DataMod program to select a previously stored configuration, establish communications with a 515 instrument, apply further customisations if required, collect data and generate reports. For a detailed description of each part of the operation including creating configurations, communications setup, data collection and how to customise reports, please refer to the appropriate sections.

Quick Guide for Live Time-based Data Collection

This quick guide example shown in Table 3 demonstrates the basic steps required to collect data and generate a custom report of collected time-based data.

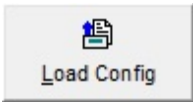
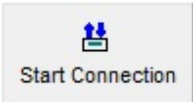
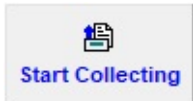
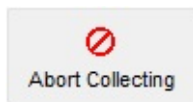
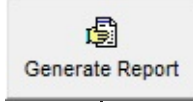
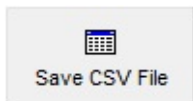
Step	Toolbar Button	Description
1. Load Configuration	 ↓	Load a previously saved custom configuration record (found on the Configurations List screen). This will setup all data collection details, i.e. Modbus/Logging settings, preferred variables selection and custom text, etc.
2. Start Connection	 ↓	Open the Data Collection Options dialog box which provides the opportunity to verify or set the type of instrument and type of data collection required and click Start to establish connection. The instrument will be identified and the Report Items screen will be populated with the instrument info and the main menu items.
3. Start Collecting	 ↓	Start Collecting data from the instrument and view progress on the status bar, each incoming data record on the Report Item screen or the collected data on the Report Data screen.
4. Abort Collecting	 ↓	Stop the data collection process. The data collected prior to stopping the process is retained and can be viewed, printed and manually exported as PDF or CSV.
5. Generate Report	 ↓	After data has been collected, a report can be generated from the Report Data screen. The report will be opened in a Preview window with the ability to print, save or export as PDF.
6. Save CSV	 ↓	After data has been collected, the Report Data can be saved in CSV format for future use with other applications.

Table 3 Quick Guide Example of DataMod Operation for Time-based General Applications

Quick Guide for Load based Auto Collection & Print

One of the key designed uses of DataMod is to provide a simple and efficient way for 515 Load controller installations to get a report (delivery docket) generated and printed automatically to the host computer's default A4 printer, each time an operator or driver completes a load. It is a significant benefit to have the load delivery docket already printed and awaiting collection by the time the operator or driver arrives at the office.

The quick guide example shown in Table 4 demonstrates the minimal steps required for a control room operator to start the DataMod program ready to automatically generate and print reports. This example assumes that a saved configuration record with the required Modbus settings, custom text and report template has already been loaded and that the Rollover Number has been set to 1 for one load per report.

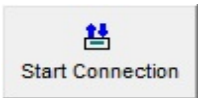
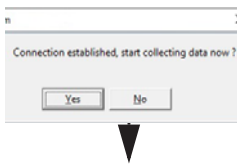
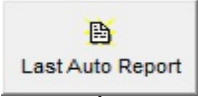
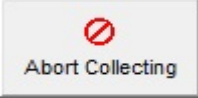
Step	Toolbar Button	Description
1. Start Connection		Open the Data Collection Options dialog box. The loaded configuration should already have the Application Type set to Load and Auto Collect, Auto Save Reports and Auto Print Reports selected. Click Start to establish connection. The instrument will be identified and the Report Items screen will be populated with the instrument info and the main menu items.
2. Confirm Start Collecting Now		After connection has been established, click Yes to start the collection process immediately.
At this point the DataMod program monitors the 515 Load controller. When DataMod detects that a load has just been completed, the delivery data is collected, data is displayed in Report Items and Report Data screens and a report is generated and printed automatically. DataMod then continues to monitor the 515 Load controller, ready to detect the completion of the next delivery. DataMod can continue to monitor the load controller indefinitely and as the program needs no interaction to automatically generate and print reports, it can be minimised on the computer screen to run in the background.		
3. Last Auto Report		If the printer was off-line at the time of Auto-print or additional copies of a the last report are required, the Last Auto Report button can be used to open the Report in the default PDF reader and printed again.
4. Abort Collecting		When automatic report and print generation is no longer required or changes to the setup are required, stop the data collection process with the Abort Collecting button. The reports collected prior to stopping the process have been saved in the 'reports' folder in PDF and CSV formats.

Table 4 Quick Guide Example of Auto Collection for Load Applications

Quick Guide for Polling Multiple Load Controllers, Collection & Print

DataMod is also designed to provide a very effective means to operate with installations of multiple 515 Load controllers. DataMod can poll controllers in turn to generate a report (delivery docket) and print automatically to the host computer's default A4 printer, each time an operator or driver completes a load. There are significant cost savings and efficiency in allowing multiple Load controllers to share the same office printer and to have data collected and saved at a central point.

The quick guide example shown in Table 5 demonstrates the minimal steps required for a control room operator to start the DataMod program polling field instruments to automatically collect, generate and print reports. This example assumes that saved configuration records with the required Modbus settings, custom text and report template, have already been setup as 'Polling List' configurations.

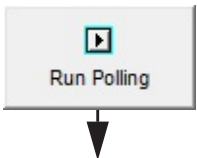
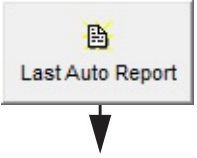
Step	Toolbar Button	Description
1. Run Polling		Click the Run Polling button to start polling and collecting from the controllers in the field. The appropriate configurations should already have the Application Type set to Load and should have the Include in Polling List, Auto Save Reports and Auto Print Reports options selected. Configurations set as Include into Polling List will be shown in coloured text. When polling is in progress, the list of Stored Records is reduced to show polling configuration records only. (For more details refer to Poll Multiple Instruments on page 48.)
At this point the DataMod program polls each of the field 515 Load controllers in sequence. When DataMod detects that a load has been completed on any controller, the delivery data is collected, data is displayed in Report Items and Report Data screens and a report is generated and printed automatically. DataMod records the Last Polled transaction number and then continues to poll the list of 515 Load controllers to detect the completion of the another delivery from any of the controllers. DataMod can continue to monitor the load controllers indefinitely and as the program needs no interaction to automatically generate and print reports, it can be minimised on the computer screen to run in the background.		
3. Last Auto Report		If the printer was off-line at the time of Auto-print or additional copies of a the last report are required, the Last Auto Report button can be used to open the Report in the default PDF reader and printed again. Likewise, previous reports can be accessed from the directory where they are saved.
4. Abort Collecting		When automatic report and print generation is no longer required or changes to the setup are required, stop the data collection process with the Abort Collecting button. The reports collected prior to stopping the process have been saved in the 'reports' folder in PDF and CSV formats.

Table 5 Quick Guide Example of Polling Multiple Load Controllers

Quick Guide for Load, Batch or Site Access Report Collection

An important feature of DataMod is to be able to collect and generate a report for a specific range of transaction numbers for event based applications such as Load, Batch or Site Access. When DataMod is configured to collect previously logged transaction records, the default start and end points are determined by the Start Number and Number of Logs in the Logs to Retrieve section, however a Transactions Collection Options dialog box (opens automatically once connection is established) allows the range of logged records to be specified by Starting and Ending Transaction Numbers.

The quick guide example shown in Table 6 demonstrates the minimal steps required for an operator to collect and generate a report for specific range of records. This example assumes that a saved configuration record with the required Modbus settings, custom text and report template has already been loaded .

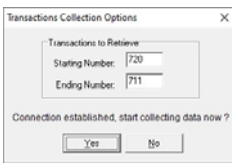
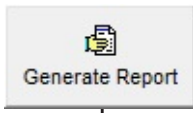
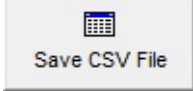
Step	Toolbar Button	Description
1. Start Connection		Open the Data Collection Options dialog box. The loaded configuration should already have the Application Type set to Load, Batch or Access and Auto Collect should NOT be selected. If known, enter the Start Number and Number of Logs in the Logs to Retrieve section (noting a Starting Number of 1 allows the user to identify the last transactions number before commencing collection of records). Click Start to establish connection. The instrument will be identified and the Report Items screen will be populated with the instrument info and the main menu items.
2. Confirm Start & End Transaction range & Start Collecting Now		After connection has been established, the Transaction Collection Options dialog box will prompt for the Starting and Ending transaction numbers. Edit the values to collect the deliveries of interest. Click the Yes to start the collection process immediately.
At this point the DataMod program collects the desired transaction records from the 515 Load, Batch or Site Access controller. As the transactions data is collected the data can be viewed in Report Items and Report Data screens. When the specified transaction records have all been collected, the 'Last successfully retrieved transactions' are displayed on the Configurations List screen and DataMod returns to an idle state where custom text and item in the report can still be changed. Reports can then be generated and saved as PDF or CSV files.		
NOTE: Saving or Loading a configuration record at this point will clear the collected data.		
3. Generate Report		After data has been collected, a report can be generated from the Report Data screen. The report will be opened in a Preview window with the ability to print, save or export as PDF.
4. Save CSV		After data has been collected, the Report Data can be saved in CSV format for future use with other applications.

Table 6 Quick Guide Example of Report Collection for Event Based Applications

DataMod Setup

This section of the 500 DataMod Tool User Guide describes in detail how the program is setup and customised to collect data from a 515 instrument with compatible application software¹. It describes how configuration records are created and used to make it easy to collect data from different field instruments and also how automatic email alerts can be used to indicate when live or auto data collecting is unexpectedly aborted.

The DataMod program 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**. Data can be collected as live or previously logged data and the collection can be tailored for 515 instruments of a General, Load, Batch or Site Access type. The prepared data can then be used to generate a structured report that can be saved, printed or exported in PDF or CSV format.

The features of Polling, Auto Collect, Auto Save Reports and Auto Print Reports, in conjunction with a custom report template allow the DataMod software to be used as a very simple way for standalone or multiple Load, Batch or Access applications to get a professional A4 transaction (delivery) docket to be printed automatically on the host computers default office printer without any operator intervention.

Figure 5 below shows an example of the **Report Items** screen after data has been collected using a configuration record with custom header, tags and selections.

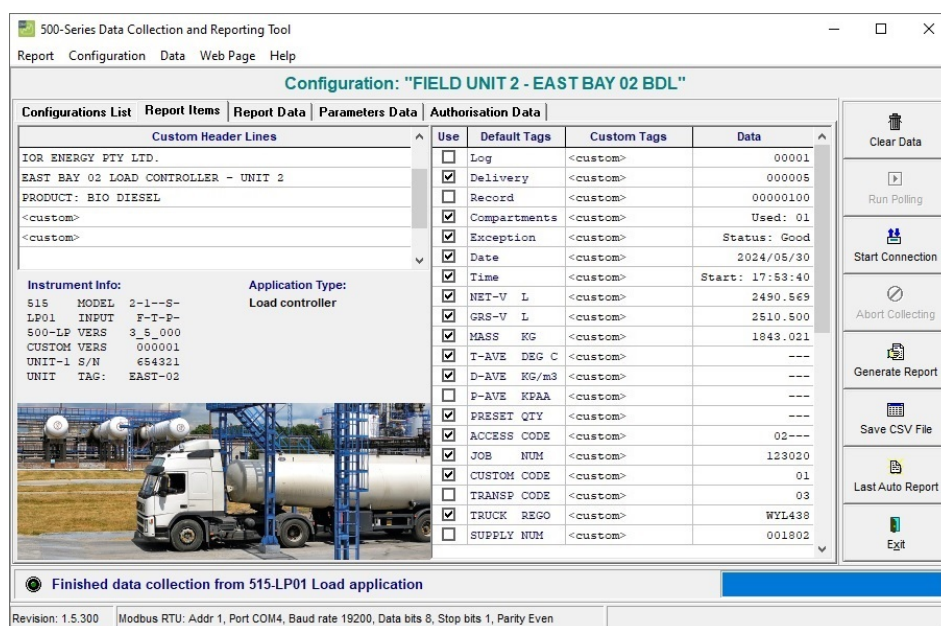


Figure 5 Example 500 DataMod Report Items screen

The instructions and information provided below will describe the DataMod program settings and how the functions and features of the 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 (or 3.0.389 if Load application and auto-collecting is required).

Recommended Setup Process

DataMod is a flexible program for collecting data from 515 instruments in a number of ways, however there are still some logical steps that will assist with the setup process. This part of the user guide will assist by working through the recommended setup process, carried out in the following order:

1. Identify the type of instrument, communication settings, type of logging and the type of data collection and reports required.
2. Use the Configuration menu to access the Modbus Connection Setting dialog box and enter the required settings.
3. Use the Configuration menu to access the Data Collection Options dialog box and enter the required settings.
4. If required, use the Configuration menu to access the Email Alert settings.
5. Establish initial connection with the 515 unit to collect the list of instrument tags and variables.
6. On the **Report Items** tab, add any custom header text and tags and select required variables to be included in the generic reports.
7. If required, use the Configuration menu to access the Load Report Template function (a custom Report Template can also be loaded at a later point).
8. Use the New Record button on the **Configurations List** tab (or item in the Configuration menu) to create a named and stored configuration record to save all of the above custom settings for easy reuse.

Important Notes on Configuration Records

The use and management of Configuration Records are described later in the chapter in **Storing & Auto-Saving Configurations** on page 34, but at this stage it is beneficial to understand some key points.

- Stored Configuration Records can be easily copied, modified and saved.
- The colour of the current Configuration title indicates if any part of the configuration has been changed from the original loaded record. A green title indicates no change while a red title and the word ‘(modified)’ indicates changes have been made, giving the prompt to save or create a new record.
- The configuration in use when the program is closed is auto-saved as the current record and is automatically reloaded when the program is re-opened.
- To initially create a complete configuration record, it is only required to establish the initial connection to collect the variable list so that Custom Text and Tag changes can be made and saved. Logged or live data does not need to be collected at this point.
- Loading a configuration record will clear any previously collected data because the freshly loaded configuration may not align with the variables or data. Loading a configuration record should be done before collecting data from the field instrument.

Logging and Data Collection Types

The DataMod program uses industry standard Modbus RTU communications protocol to access the data held in the instruments. The 515 instrument can be a General flow type application (with time based logging) or an application with transaction (event based) logging, such as Load, Batch or Site Access applications.

As well as extracting the previously logged data, DataMod allows live data to be collected from the General (flow) type applications at programmable intervals. The DataMod program also provides the option of continual monitoring of the transaction type applications to Auto Collect the last transaction data as soon as a transaction (event) is complete. By using the 'Include into Polling List' option, DataMod can poll and collect transactions from multiple field instruments so that printing and report storage is done from a central point.

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. 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.

Transaction based logging

When an instrument uses transaction (event) based logging, a log of the relevant data is taken at the end of a transaction. The most recent log is numbered as Log 00001 with older logs having increasing numbers. For example, a log that was stored 5 transactions ago will be numbered as Log 00005, etc.

A unique number is also assigned to each transaction record and is stored as part of the logged data. The number increments with each transaction made and it is only reset when the instrument logs are cleared. The collection of records can be specified in terms of Logs and/or Transaction numbers. Initially records to be collected are specified in terms of log numbers (Data Collection Options screen), but after connection is established, the specified logs are displayed in terms of their corresponding transaction numbers (Transactions Collection Options screen) that can be adjusted if required.

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

Typically the logs of transaction records are collected starting from the most recent one (Log Starting Number set to 1), but users can change the logs retrieval **Starting Number** and **Number of Logs** to suit their needs (refer to Figure 9).

In the case of collecting transaction records from event based applications, it is recommended that the Logs to Retrieve **Starting Number** remains the default value of 1, so that the Transactions Collection Options (displayed after connection is established) will reflect the last logged transaction number. With this as a clear reference point the desired range of records can be changed and specified in terms of transaction numbers as per Figure 6.

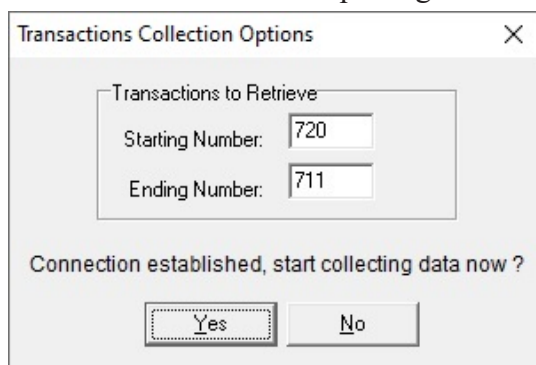


Figure 6 Connection Established - Transactions Collection Option

The range of 'Last successfully retrieved transactions' is stored and displayed on the **Configurations List** tab for quick and convenient reference.

Live Data Collection (General Application Type)

When data is required to be captured from an instrument on a more frequent or different time basis than the 515 internally logging, or there is the desire for ongoing automatically generated reports, then the **Live Data Collecting** options should be used. If either of the 'Live' **Log Types** are selected, the **Interval** (in seconds) and the **Rollover Number** can be entered.

If for example, the **Interval** is set to 60 (seconds) and the **Rollover Number** is set to 10, then a snap shot of the live data is collected every minute and, if the **Auto Save Reports** option is selected, a report in PDF and CSV format, is automatically saved every 10 records (in this case, every 10 minutes). The status line indicates the progress of the collection cycle. The Auto Saved reports in a default installation are saved in: C:\Contrec\500-DataMod\reports.

If automatic printing of reports is required, refer to [Auto Print Reports](#) on page 24.

Auto Collect (Event Based Application Types)

When the 515 **Application Type** is either Load, Batch or Access, the **Auto Collect** option can be used to ensure the DataMod program continually monitors the 515 instrument to identify when a record is ready to be collected on completion of a transaction. The **Rollover Number** is used to determine the number of records in the cycle to be held in the **Report Data** screen before the oldest is removed from the list and the new one is added.

If for example, the **Rollover Number** is set to 10, then the 11th transaction record will overwrite the 1st record collected in that collection cycle. If the **Auto Saved Reports** option is selected, a report in PDF and CSV format will be automatically saved every 10 transactions. The status line indicates the progress of the collection cycle.

Polling of Multiple Field Units (Event Based Application Types)

When the 515 **Application Type** is either Load, Batch or Access, the **Include in Polling List** option can be used to allow the DataMod program to continually poll multiple 515 instruments in turn to identify when a record is ready to be collected on completion of a transaction. When a Stored Configuration Record has the polling option enabled, the Rollover Number is fixed to 1 so that a separate report is generated for every collected transaction.

Configurations that have polling enabled are shown in coloured text in the Stored Records on the Configuration List screen (red colour indicates failed last polling attempt). When polling is started with the Run Polling button, the Configurations List is reduced to only show those that are in the polling cycle.

The **Auto Save Reports** option is automatically selected, but it and the **Auto Print Reports** option can be set as required for the particular operation. On the **Configuration List** tab, a cursor, the Last Polled number, the Last Polled Status and general status line at the bottom of the screen indicate the progress of the polling and collection cycle.

For more information refer to [Poll Multiple Instruments](#) on page 48.

Auto Save Reports

When either '**Live**' data collection for General applications is selected or **Auto Collect** is selected for other (event based) applications, then the option of **Auto Save Reports** becomes available. This option can be used to ensure DataMod automatically saves a report of the collected data in PDF and CSV format. The **Rollover Number** is used to determine the number of records collected in a cycle before a report is generated.

The auto-saved reports in a default installation are saved in:
C:\Contrec\500-DataMod\reports

Both the PDF and CSV report file names take the format of:

515-xxxx-nnnnnn-yyyymmdd-hhmmss_uuuuuuu

where:

515-xxxx - is the instrument application pack.

nnnnnn - is the instrument serial number.

yyyymmdd - is the year, month, day date stamp when the report was generated.

hhmmss - is the hour, minute, second time stamp when the report was generated.

uuuuuuu - is the **Unit Tag** as entered in the Data Collection Options dialog box.

An example file name would be:

515-LP01-654321-20180908-134608_BAY-001.pdf

Auto Print Reports

Whenever the **Auto Save Reports** feature is selected and active, the **Auto Print Reports** option becomes available. If enabled, this DataMod feature allows the PDF report, as it is generated, to be automatically printed to the host computer's default office printer using its default settings. It is important to test the printout and adjust any required settings of the office printer.

After the data is collected and the PDF and CSV reports are automatically generated and saved, the DataMod program will print the PDF report to office printer and then continue communication with the 515 instrument to collect data and generate reports as required.

Auto Print for Load Applications

For Load applications especially, the Auto Print feature is designed to be used as a simple way for installations of a single or multiple Load Controllers to get an A4 delivery docket to print automatically without any operator intervention. The Auto Collect feature is ideal for a standalone controller, while the Polling feature is designed for multi controller installations. DataMod will automatically trigger a printout of the PDF reports using the computers default printer and its default settings.

Note: if a docket or report needs to be generated for every transaction for event based applications (such as Load, Batch or Access), then the **Rollover Number** should be set to 1.

For a professional and tailored report, Contrec can be contacted to arrange for the purchase of a custom Report Template designed to suit such requirements, as shown in the examples in [Samples of Custom Reports](#) on page 46.

Modbus Connection Settings

The **Modbus Connection Settings** dialog box is used to provide selection of the Transmission Mode and then RTU Serial Settings or the TCP/IP Settings, depending on the selection.

The **Modbus Connection Settings** can be accessed via the menu toolbar (under Configuration or via the **Data Collection Options** dialog box, which is opened as part of the **Start Connection** process.

Please note that the DataMod program initial settings are RTU Serial, with port configurations that 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.

An example of the **Transmission Mode** being set to **RTU Serial** and the associated serial settings are shown in Figure 7.

The image shows a 'Modbus Connection Settings' dialog box. It has three main sections: 'Transmission Mode', 'RTU Serial Settings', and 'TCP/IP Settings'. In the 'Transmission Mode' section, 'RTU Serial' is selected with a radio button. The 'RTU Serial Settings' section contains 'Serial Port' (COM1), 'Baud Rate (bps)' (19200), 'Data Bits' (8 bits), 'Parity' (Even), and 'Stop Bits' (1 bit). The 'TCP/IP Settings' section contains 'Host Name / IPv4 Address' (192.168.0.7), 'Port' (502), 'Receive Timeout (sec)' (2), 'Maximum Retries' (2), and 'Slave Unit Address' (1). There are 'OK' and 'Cancel' buttons at the bottom right.

Modbus Connection Settings	
Transmission Mode	
☒ RTU Serial	☐ TCP/IP
☐ RTU over TCP/IP	
RTU Serial Settings	
Serial Port: COM1	Baud Rate (bps): 19200
Data Bits: ☐ 7 bits ☒ 8 bits	Parity: ☐ None ☐ Odd ☒ Even
Stop Bits: ☒ 1 bit ☐ 2 bits	
TCP/IP Settings	
Host Name / IPv4 Address: 192.168.0.7	Port: 502
Receive Timeout (sec): 2	Slave Unit Address: 1
Maximum Retries: 2	
OK Cancel	

Figure 7 Modbus Connection Settings - RTU Serial Communications

The DataMod program's default Modbus settings for **Receive Timeout** and **Maximum Retries** should suit most 515 instrument applications. However, these settings can be changed if required.

An example of the **Transmission Mode** being set to **TCP/IP** (or **RTU over TCP/IP**) and the associated TCP/IP settings are shown in Figure 8.

The image shows a 'Modbus Connection Settings' dialog box with a close button (X) in the top right corner. It is divided into three main sections: 'Transmission Mode', 'RTU Serial Settings', and 'TCP/IP Settings'.
1. **Transmission Mode:** Contains three radio buttons: 'RTU Serial', 'TCP/IP' (which is selected), and 'RTU over TCP/IP'.
2. **RTU Serial Settings:** This section is partially visible and includes:
 - 'Serial Port:' dropdown menu set to 'COM1'.
 - 'Baud Rate (bps):' dropdown menu set to '19200'.
 - 'Data Bits' section with radio buttons for '7 bits' and '8 bits' (selected).
 - 'Parity' section with radio buttons for 'None', 'Odd', and 'Even' (selected).
 - 'Stop Bits' section with radio buttons for '1 bit' (selected) and '2 bits'.
3. **TCP/IP Settings:**
 - 'Host Name / IPv4 Address:' text field containing '192.168.0.7'.
 - 'Port:' text field containing '502'.
 - 'Receive Timeout (sec):' spin box set to '2'.
 - 'Maximum Retries:' spin box set to '2'.
 - 'Slave Unit Address:' spin box set to '1'.
At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Figure 8 Modbus Connection Settings - TCP/IP Communication

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.

Note: Any Modbus connection settings entered by the user or loaded as part of a stored configuration record, will automatically be saved and held in the current configuration record. The DataMod program can be closed and re-opened and settings will still apply. For more information, refer to **Storing & Auto-Saving Configurations** on page 34

Data Collection Options Setup

The **Data Collection Options** dialog box allow the nature of the DataMod data collection to be defined. This includes the 515 Application Type and the type and number of logs to be collected.

The **Data Collection Options** can be accessed via the menu toolbar (under Configuration) or accessed as part of the **Start Connection** process which gives the opportunity to confirm that the Application Type is correct and the Data Collection Options are as required before proceeding with data collection.

As all DataMod settings are automatically saved for re-use to simplify the operation of the program, there will be no requirement to make changes to the settings if DataMod is being used for repetitive data collection.

Click on the  button or the Collection Options item in the Configuration menu to open the **Data Collection Options** dialog box as shown in Figure 9.

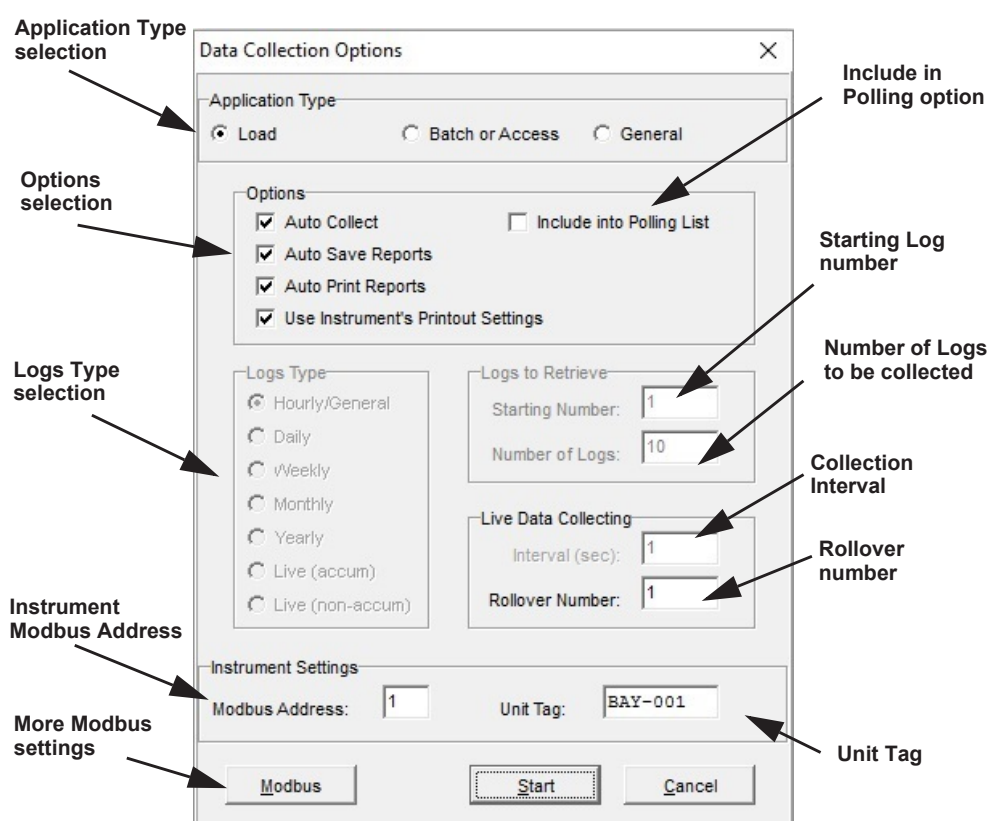


Figure 9 Data Collection Options dialog box.

Refer to the following information for a detailed description of each setting.

Once the required selections and settings have been made, the user would click **Start** to continue with the Start Connection process, or click **Cancel** to return to the main screen.

A number of options and selections are available to allow the data of interest to be collected from the instrument. The available selections are described below. Greyed out options indicate that they are not applicable to the selected configuration. Refer to **Logging and Data Collection Types** on page 21 for full detail and description.

- **Application Type** - The application type (General, Load, Batch or Access) determines how data is collected and what options and selections become available. The General type has time based logging, while other types have transaction (event) based logging.
- **Options**
 - **Include into Polling List** is only available for transaction (event based) logging.
 - **Auto Collect** is only available for transaction (event based) logging.
 - **Auto Save Reports** is available for 'Live' data collection or when event based application type is set to Auto Collect.
 - **Auto Print Reports** is only an available option when Auto Save Reports is selected and active.
 - **Use Instrument's Printout Settings** can be selected to allow the instrument's printout settings 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. Note: that using the Instrument's Printout Settings will overwrite settings of the Report Items check boxes and may the Configuration title may become 'modified'.
- **Log Types** - This section is only available for General type applications. When collecting data from a 515 Flow Computer or Controller with time based logs, the type of log of interest (a particular Timebase or Live log) should be selected.¹
- **Logs to Retrieve** - Enter the log **Starting Number** and **Number of Logs** to be collected.
- **Live Data Collecting** - Enter the live collection **Interval** time and the **Rollover Number** that determines the cycle and report length.
- **Instrument Settings** - Enter the **Modbus Address** (RTU slave address) of the 515 instrument (range 1-247) and enter the **Unit Tag** that will be included in the generated reports and in the report's PDF and CSV file names.
- **Modbus** - This button is used to gain access to the Modbus Connection Settings dialog box (including computer serial port settings) as described in **Modbus Connection Settings** on page 24. While the 515 instruments use Modbus RTU to provide access to data, the DataMod program also provides the option of using TCP/IP connection for remote access and IoT solutions. If TCP/IP connection is used in DataMod, the 515 unit will need the 515ETH Ethernet option card fitted or a serial to TCP/IP converter is required on the instrument side.

Note: Any Data Collection Option settings entered by the user or loaded as part of a stored configuration record, will automatically be saved and held in the current configuration record. The DataMod program can be closed and re-opened and settings will still apply. For more information, refer to **Storing & Auto-Saving Configurations** on page 34

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

Email Alert Option

The DataMod program allows email alerts to be sent if live or auto data collection is aborted due to a disruption to communications. The disruption could be due to a number of causes at the computer or the instrument end, but the key aim of the alerts is to ensure the appropriate contacts are made aware that operator intervention is required to resolve the issue and re-establish communications and restart the data collection.

Use the Configuration menu to select the Email Alert option as shown in Figure 10.

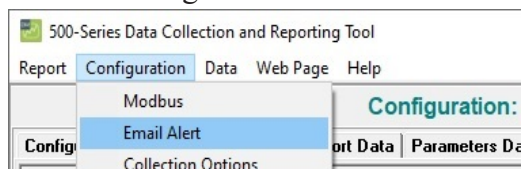


Figure 10 500 DataMod Configuration Menu - Email Alert

Open the **Email Alert Options** dialog box as shown in Figure 11.

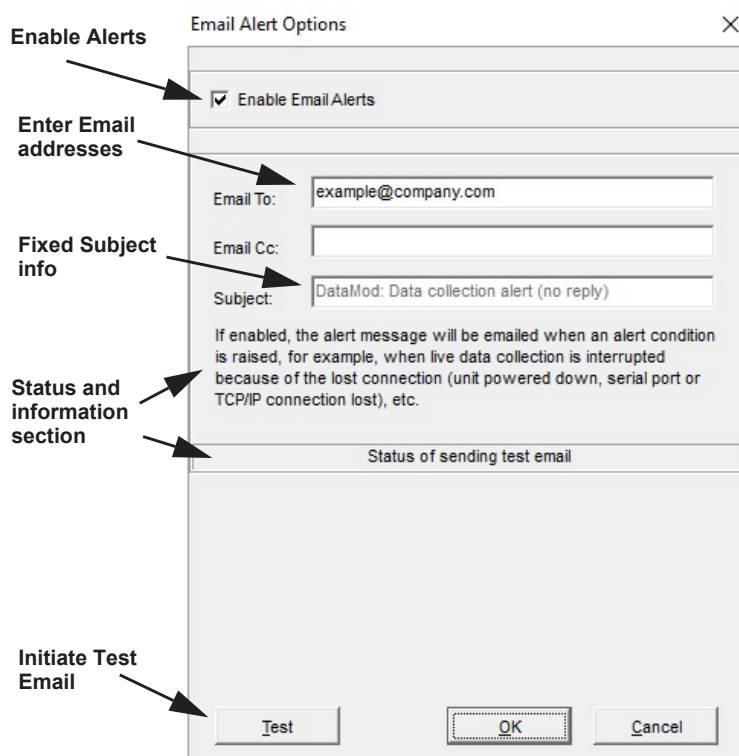


Figure 11 Email Alert Options dialog box.

Multiple addresses can be entered into the 'Email To:' or 'Email Cc:' fields with a comma (,) or semicolon (;) separating the addresses (no spaces are allowed). Changes to the address fields are saved with the OK button and the TEST button initiates an email to the recipients straight away to confirm the email operation.

During normal operation, the Email Alert is sent when a communication failure occurs, and if minimised, the DataMod program is restored to the computer screen. For this feature, it is also essential that any Firewall security allows the SMTP port to remain open (for example, Gmail uses port 465 for secure SSL connection).

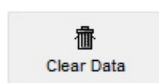
Establish Connection

For some data collection applications the processes described below are used on a regular basis, but for features such as Polling where the connection and data collection is simplified and automated, these configuration processes are primarily used for the initial setup. Once set as required, a configuration can be saved and added to the list of Stored Records for easy access, which is automated in the case of the Polling feature.

Clear Data

The Clear Data function clears any collected data and custom text or selections from the **Report Items** and **Report Data** screens. This is generally only used when there is a new type of instrument or if fresh custom settings need to be applied.

Click on the



button to clear the data.

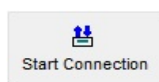
Start Connection

Before the collection of data is started, the DataMod program first requires communication connection to be established. This allows the instrument to be identified, and essential instrument information and main menu items to be gathered and displayed on the **Report Items** screen. This then gives the user the opportunity to apply any required custom text or item selection.

Note: To make the use of DataMod more efficient, the last used set of configuration settings, including custom text, is always automatically restored after restarting the software regardless of the connected instrument. It is therefore the user's responsibility to ensure that appropriate configuration or customisation is applied.

The Start Connection process includes giving the user the opportunity to confirm the Application Type is correct and the Data Collection Options are as required before proceeding.

Click on the



button to open the **Data Collection Options** dialog box as shown in Figure 9.

If any setup changes are required, refer to **Data Collection Options Setup** on page 27 for detailed information.

Also, if required, the **Modbus Connection Settings** can be accessed and confirmed via the **Modbus** button on the Data Collection Option dialog box. Refer to **Modbus Connection Settings** on page 24 for detailed information.

Establishing Connection

Click **Start** at the bottom of the **Data Collections Option** dialog box to establish connection once the hardware connection is in place with the appropriate matching communications setting on the instrument and computer.

The status bar will show an initial progress message relating to scanning for the instrument and then 'Collecting Instrument Info' and then 'Tags' as per Figure 12.

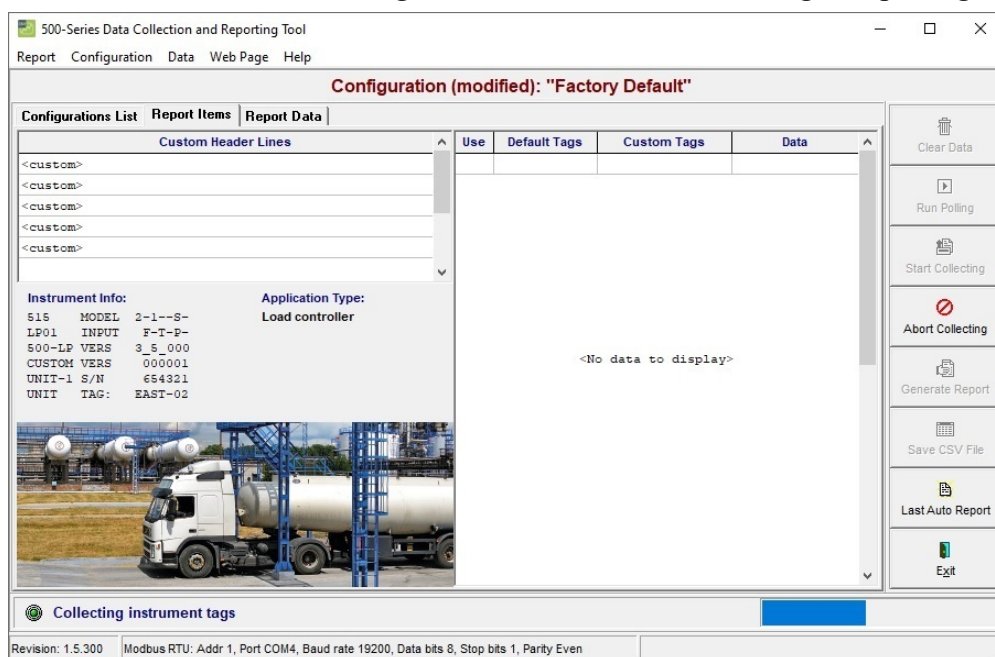


Figure 12 Start Connection - Collecting Instrument Tags

For General type applications and other (event based) applications with Auto Collect selected:

After the connection has been established and the instrument information and tags have been collected, the DataMod program will then present the prompt as per Figure 13 .

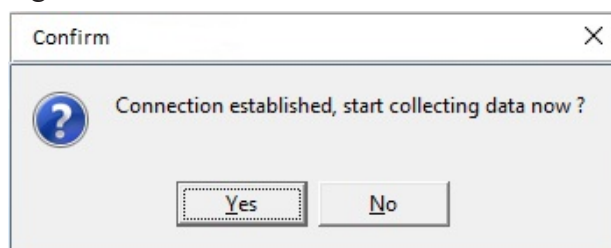


Figure 13 Connection Established - Start Collecting Data Prompt

For transaction (event based) applications without Auto Collect selected:
After the connection has been established and the instrument information and tags have been collected, the DataMod program will then present the prompt with opportunity to set **Transactions to Retrieve** as per the example in Figure 14.

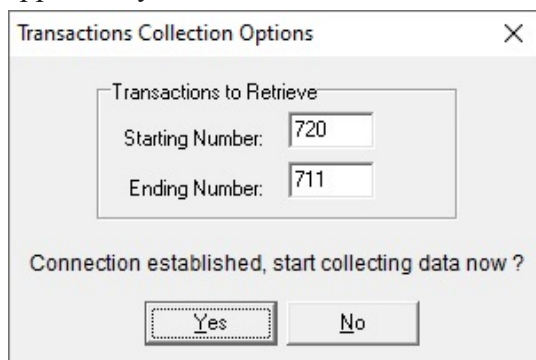


Figure 14 Connection Established - Transactions Collection Option

Click 'Yes' if text and tags customisation is not required (i.e. DataMod configuration has previously been setup), to proceed directly to collecting data as per **Data Collection** on page 40.

Otherwise, press 'No' and the Instrument Info and main menu items will be displayed in the Report Items screen as per Figure 15.

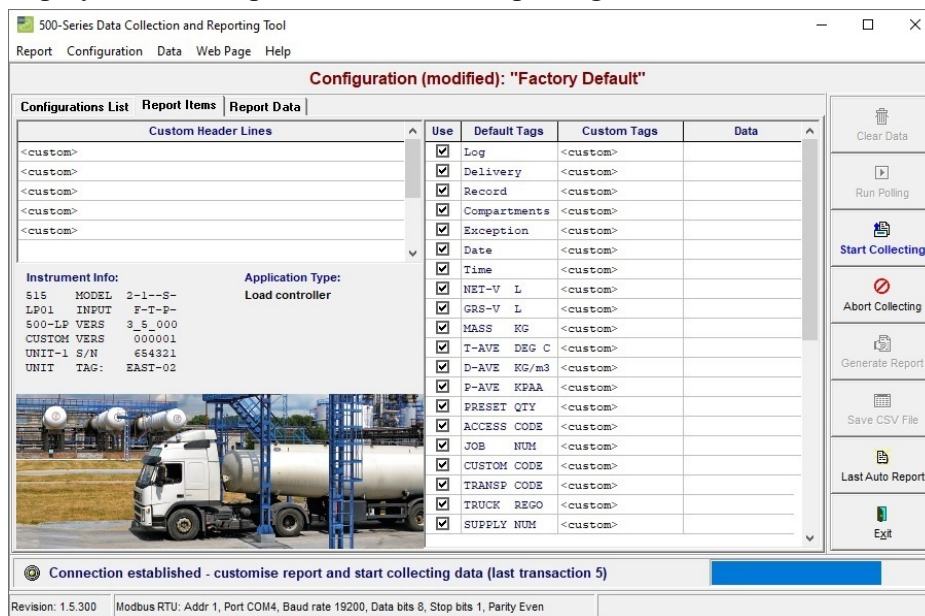


Figure 15 Connection Established - Report Items displayed

Although it can be done at any time except when collecting data, this is a practical point at which changes to custom text and item selection can be made or a custom **Report Template** can be loaded.

Custom Text and Tags

Set Custom Text and Tags

After connection has been established, it is a practical time when custom text can be entered into the *Custom Header Lines* and the *Custom Tags* as shown in Figure 16. Items that are not required in the report data can be deselected using the tick boxes in the 'Use' column.

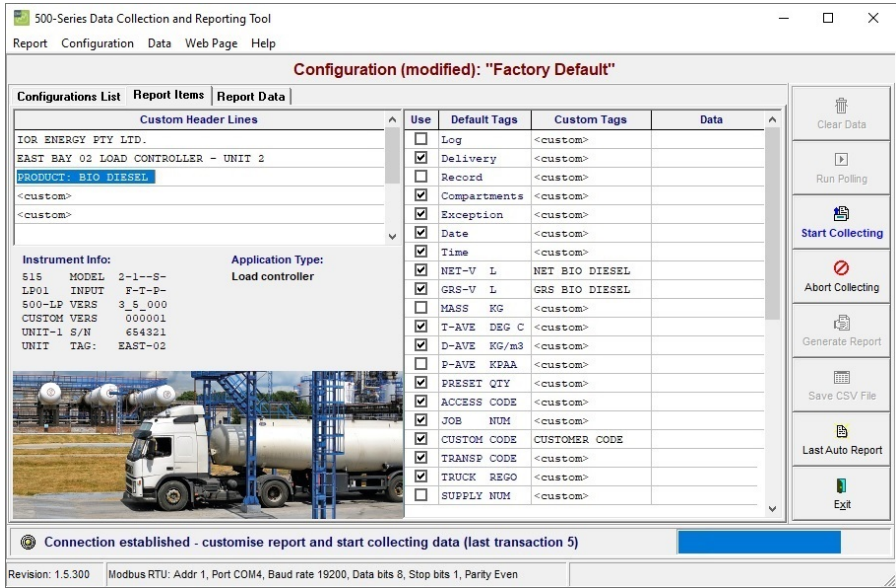


Figure 16 Report Item - Set Custom Text and Tags

The custom text and selected items will then be reflected when data is viewed in the *Report Data* screen.

Note: Any Custom Text or Tags entered by the user or loaded as part of a stored configuration record, will automatically be saved and held in the current configuration record and will remain until the Clear Data button is used. The DataMod program can be closed and re-opened and text and tags used before closing will still apply. For more information, refer to [Storing & Auto-Saving Configurations](#) on page 34

Storing & Auto-Saving Configurations

Stored Configuration Records provide the ability to easily load and use a DataMod configuration that is specific to a particular 515 field instrument or type of report required. An internal database of configuration records is used to hold the current and stored sets of custom configurations. The Configurations List screen allows records to be stored/created, saved/updated, loaded and deleted as outlined in **DataMod Configuration Records** on page 7.

As highlighted earlier, there are some important points to note about DataMod configurations:

- Stored Configuration Records can easily be copied, modified and saved to make the creation of configuration records for additional field instruments of the same application type much quicker.
- The colour of the current Configuration title indicates if any part of the configuration has been changed from the original loaded record. A green title indicates no change while a red title and the word '(modified)' indicates changes have been made, giving the prompt to save or create a new record.
- The configuration in use when the program is closed is auto-saved as the current record and is automatically reloaded when the program is re-opened.
- To initially create a complete configuration record, it is only required to establish the initial connection to collect the variable list so that Custom Text and Tag changes can be made and saved. Logged or live data does not need to be collected at this point.
- Loading a configuration record will clear any previously collected data because the freshly loaded configuration may not align with the variables or data. Loading a configuration record should be done before collecting data from the field instrument.

Storing Configuration Records

When changes have been made to the any part of the DataMod configuration (including Modbus or Data Collection settings, Custom Text or Tags, etc) the **Configurations List** tab is used to save the changes to an existing or new record.

If DataMod is newly installed, initially there are no configurations in the Stored Records list, but any configuration changes made can be stored using the **New Record** button. Initially the text <Factory Default> is used as shown Figure 17, but it can be given a unique name/title and description in the fields provided.

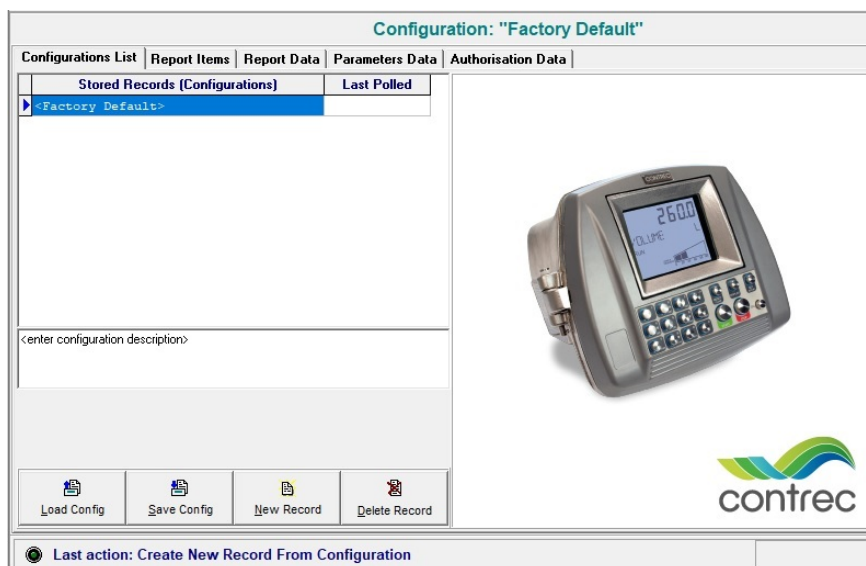


Figure 17 DataMod Configurations Management - New Record

Figure 18 shows a name and description has been entered for the new record. Note that the **Save Config** button must be used to update the Configuration title in the main DataMod screen.



Figure 18 DataMod Configurations Management - 1st Record

Creating New from Existing Records

If there is a group of 515 field instruments of the same application type it can be beneficial to create new records from an existing record. A newly created record initially takes the name of the origin record and places in < > brackets. The simple process is as follows:

- select the **Configurations List** tab to access the Stored Records list, control buttons and text fields for title and descriptions
- firstly ensure the record to be copied has been loaded by clicking **Load Config**
- create a copy of the loaded record by clicking **New Record**
- rename the record and edit the description as required, noting that the records are shown in Alpha-numerical order (name accordingly to achieve the desired order)
- select the newly created record and click **Load Config**
- make the required configuration changes to suit the field instrument (ie Modbus address, unit tag, etc)
- note the Configuration title on the main screen changes to red and shows the text '(modified)'
- ensure the correct record is selected and click **Save Config** (note this will save the current configuration settings into the selected record)
- note the Configuration title on the main screen changes to green and text '(modified)' is removed
- Repeat the process as required if there are multiple field units of the same type.

Figure 19 shows an example of the DataMod Configurations Management window with a number of stored records.

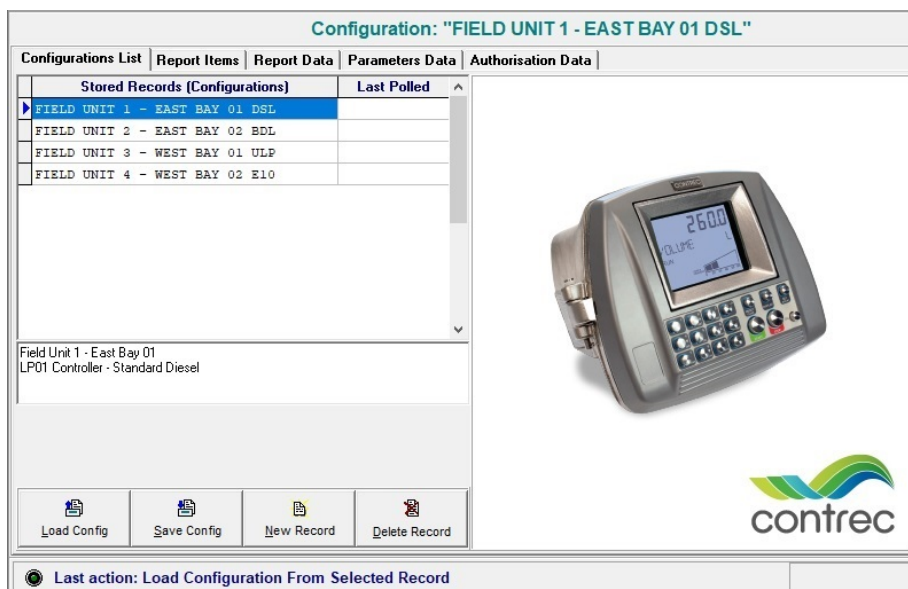


Figure 19 DataMod Configurations Management - Added Records

NOTE: A double-click on the **Stored Record** line loads the Configuration (same as clicking on the Load Config button).

Auto-Saving DataMod Configuration

The DataMod program maintains a separate record of the current (working) configuration allowing the program to open with the same configuration settings as in the last session when program was closed (capturing any configuration changes).

This auto-save feature greatly simplifies the start-up process and access to data in instruments of a fixed system.

Figure 20 shows an example of the DataMod program re-opened automatically on the **Configurations List** tab and indicating the configuration was from the **Last Session** and that it was **based on** a previously loaded custom configuration record.

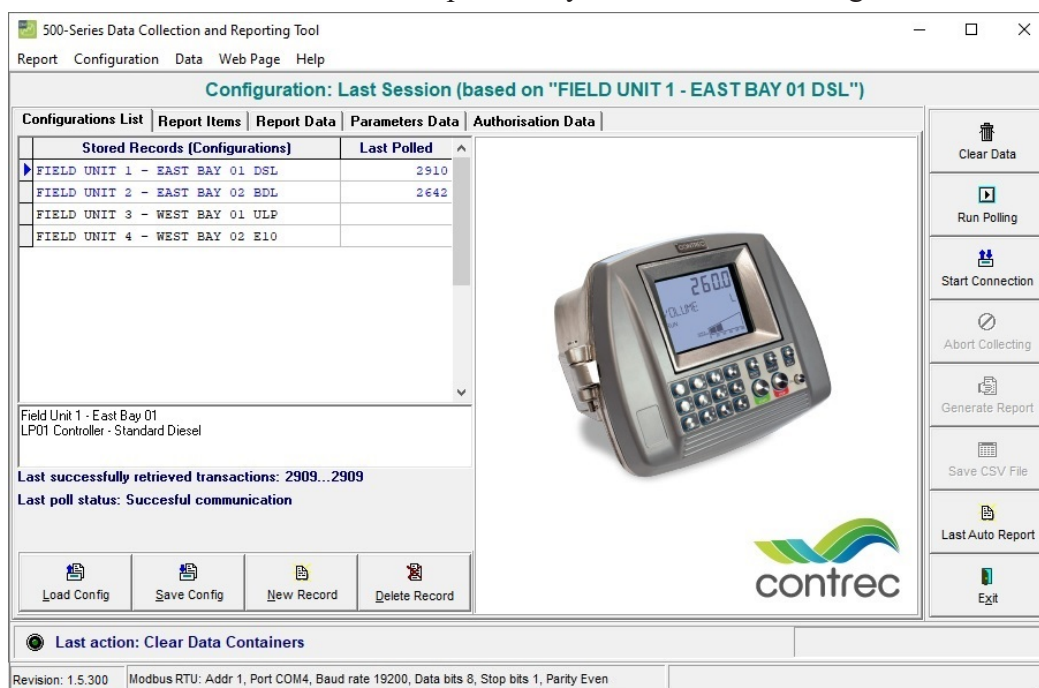


Figure 20 DataMod Configuration Title - Last Session Example

If applicable, the stored information also includes the ‘Last Polled’, the ‘Last successfully retrieved transactions’ and the ‘Last poll status’ information.

Note: Although the DataMod program re-loads the last auto-saved configuration, the required stored configuration record can be loaded again.

Typical Data Collection Process

Once setup has been completed, a typical data collection process (for a non-polling application) would involve the use of at least one stored configuration record and from this point would follow a process similar to those outlined in the [DataMod Quick Guide](#) on page 15 at the start of this chapter. The information below provides more detail and instruction on the data collection process.

For multi-instrument **Polling** applications, the start process is significantly simpler and quicker, however there is even more importance on ensuring that the setup of each 'polling enabled' configuration is correct. Polling configurations are indicated with their titles shown in coloured text in the Stored Records list. For more information and example of operation refer to [Quick Guide for Polling Multiple Load Controllers, Collection & Print](#) on page 17 or [Poll Multiple Instruments](#) on page 48.

Load a Stored Configuration Record

To make the overall data collection and report generation process much faster and simpler, a previously stored configuration record that holds all of the required settings can be loaded.

Click on the **Configurations List** tab to view Stored Records and control buttons.

It is the user's responsibility to ensure each record has the correct configuration settings for the intended field instruments. Care should be taken that the correct stored record is loaded to get the intended outcome. Therefore, it is a good practice to use a Configuration name or title that reflects the 515 application that the record relates to.

Select the required record and click on **Load Config** as per the example shown in Figure 21.

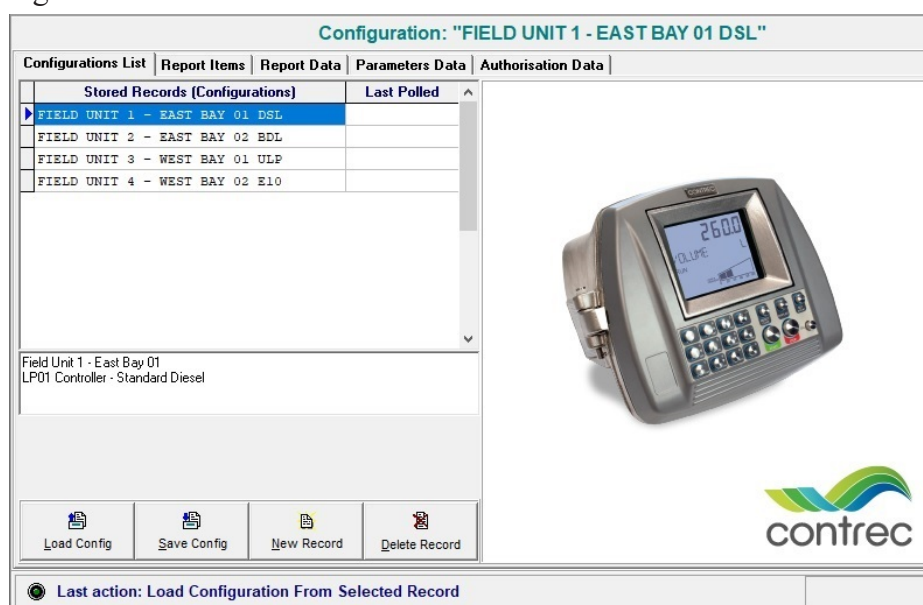


Figure 21 DataMod Configurations Management - Loading Records

When the configuration record is loaded, the **Report Item** screen will show the selected Configuration title in green text and any custom header lines will be displayed as shown in the example in Figure 22. Note that the data section will be cleared.

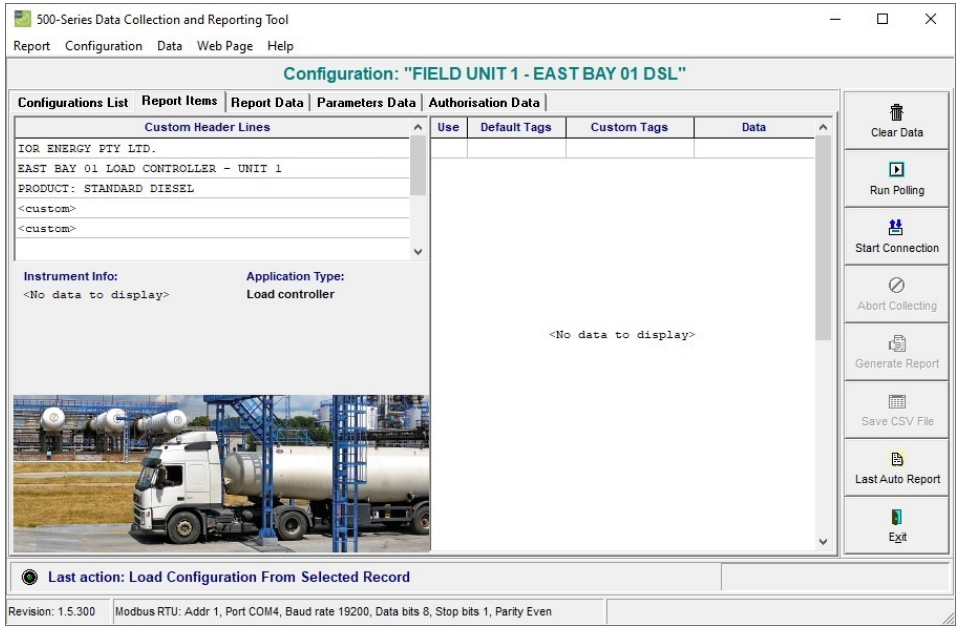


Figure 22 Report Item - Configuration Loaded

Typical Process - Establish Connection

With the required configuration record loaded, the process can move directly to establishing connection with the instrument.

Click on the  button to open the **Data Collection Options** dialog box as shown in Figure 9.

There is the opportunity to verify or change **Data Collection Options** or **Modbus Connection Settings**. If the settings are correct the process can proceed, assuming the hardware connection is in place.

Click the **Start** button at the bottom of the **Data Collection Options** dialog box to establish connection. The status bar will show an initial progress message relating to scanning for the instrument, then ‘Collecting Instrument Info’ and then ‘Tags’.

For General type applications and other (event based) applications with Auto Collect selected, the DataMod program will then present the prompt ‘Connect established, start collecting data now? Yes or No’, as per Figure 13.

For transaction (event based) applications without Auto Collect selected, the DataMod program will then present the same prompt with opportunity to set **Transactions to Retrieve** as per the example in Figure 14.

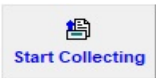
With all configuration set as required, click ‘Yes’ to proceed directly to collecting data as per **Collection Started** on page 40.

Data Collection

Although the DataMod program caters for a number of 515 application types and a range of logged data types, the general process for the data collection stage is very similar. For the purpose of description of Data Collection, the example of collecting a number of delivery records from a 515 LP01 Load Application will be used.

Start Collecting Data

If after connection has been established, collection was not started straight away (ie ‘No’ was chosen to make possible further configuration changes), the original ‘Start Connection’ button will be replaced with a ‘Start Collecting’ button with blue flashing text.

Click on the  button to start the data collecting process.

Collection Started

While data is being collected, the last collected record is shown in the Data column and the status bar indicates the cycle position as per Figure 23 .

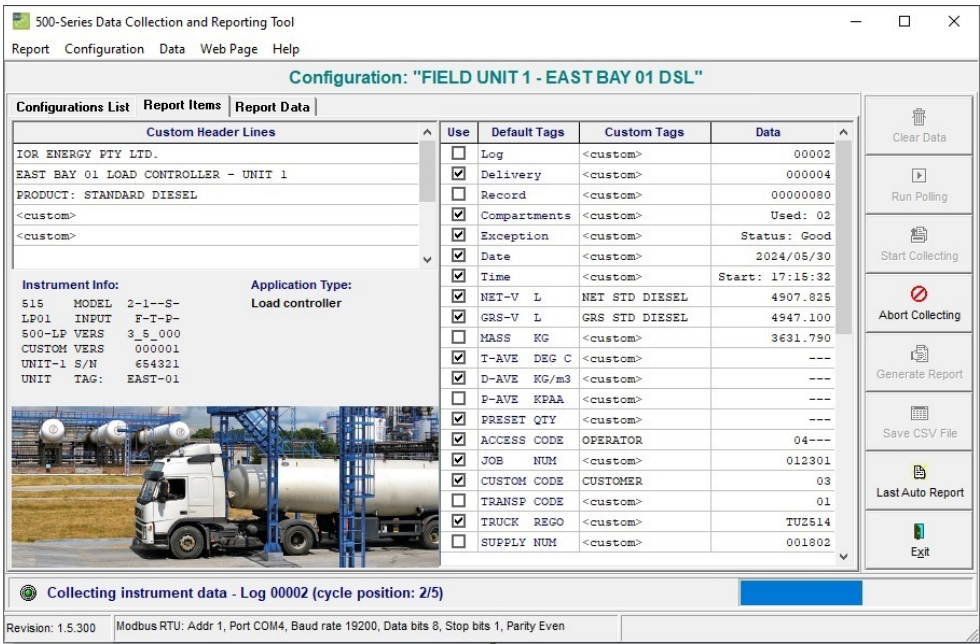
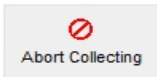


Figure 23 500 DataMod - Collecting Instrument Data

Any incoming and collected data can be viewed in the Report Data screen during the collection process.

Abort Collecting

The  button will become available and will allow a data collection cycle to be stopped. Any collected data or Auto Save reports to that point will be retained.

Data Collection Finished

Once a preset number of requested logs have been collected, the progress bar will indicate that collection has finished and the majority of the toolbar buttons will become available as shown in Figure 24 (the example data has been collected from a Load application).

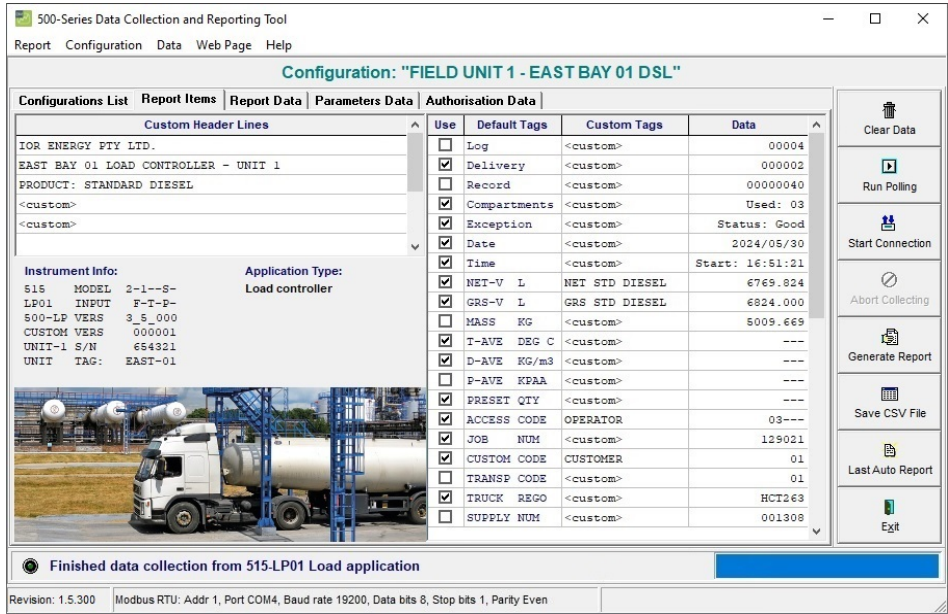


Figure 24 Report Item - Finished Data Collection

The custom text and selected items will then be reflected when data is viewed in the **Report Data** screen as shown in Figure 25. The horizontal and vertical scroll bars can be used to view all data.

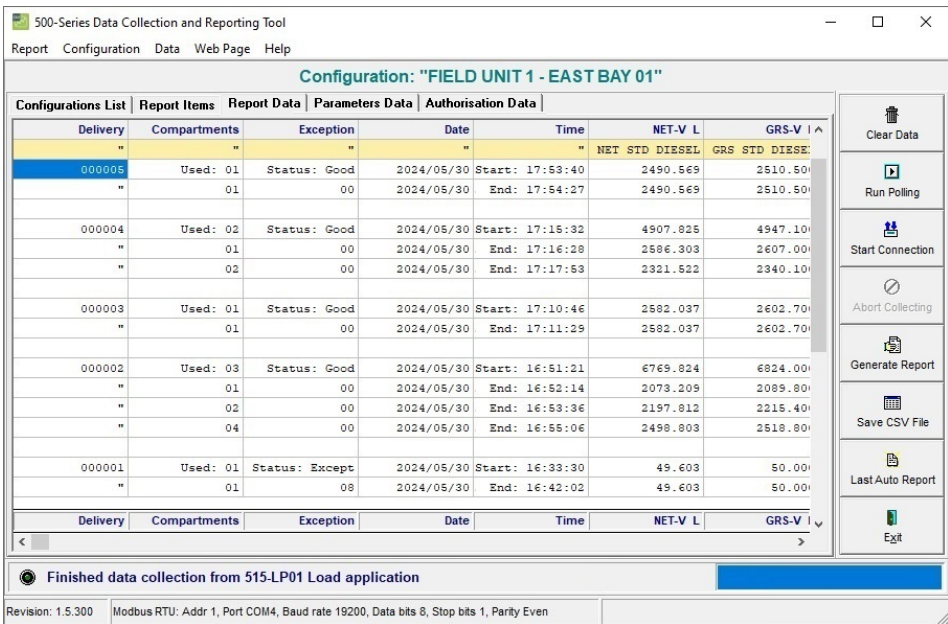
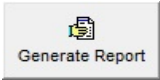


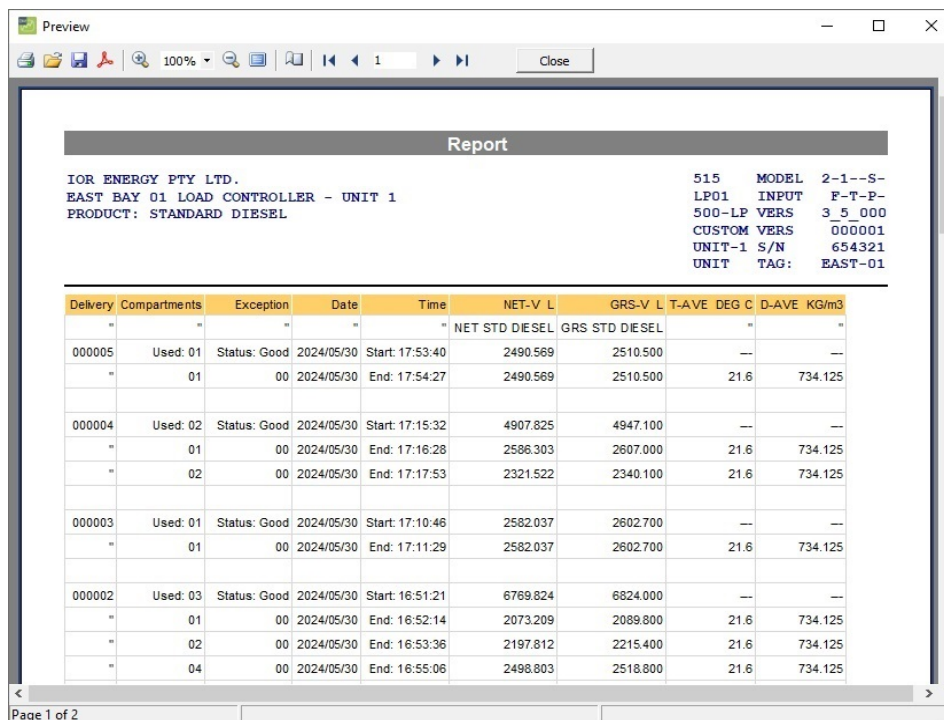
Figure 25 Report Data - View Custom Data

DataMod Reports

Generate Report

After data has been collected and any further 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 26.



Delivery	Compartments	Exception	Date	Time	NET-V L	GRS-V L	T-AVE	DEG C	D-AVE	KG/m3
					NET STD DIESEL	GRS STD DIESEL				
000005	Used: 01	Status: Good	2024/05/30	Start: 17:53:40	2490.569	2510.500				
	01	00	2024/05/30	End: 17:54:27	2490.569	2510.500	21.6		734.125	
000004	Used: 02	Status: Good	2024/05/30	Start: 17:15:32	4907.825	4947.100				
	01	00	2024/05/30	End: 17:16:28	2586.303	2607.000	21.6		734.125	
	02	00	2024/05/30	End: 17:17:53	2321.522	2340.100	21.6		734.125	
000003	Used: 01	Status: Good	2024/05/30	Start: 17:10:46	2582.037	2602.700				
	01	00	2024/05/30	End: 17:11:29	2582.037	2602.700	21.6		734.125	
000002	Used: 03	Status: Good	2024/05/30	Start: 16:51:21	6769.824	6824.000				
	01	00	2024/05/30	End: 16:52:14	2073.209	2089.800	21.6		734.125	
	02	00	2024/05/30	End: 16:53:36	2197.812	2215.400	21.6		734.125	
	04	00	2024/05/30	End: 16:55:06	2498.803	2518.800	21.6		734.125	

Figure 26 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 27.

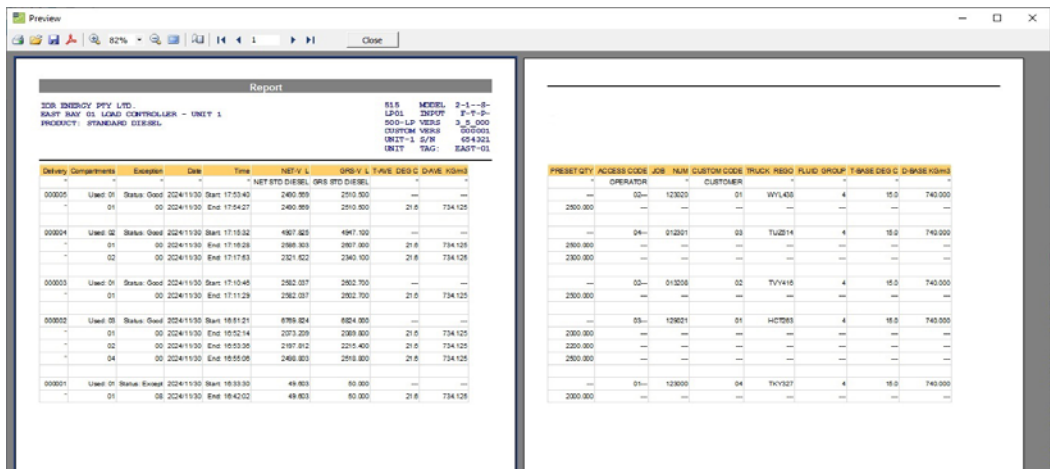
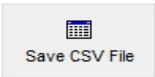


Figure 27 DataMod Report Preview - Double page

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 28. Select the preferred destination folder, enter the file name and click Save to save the .csv file.

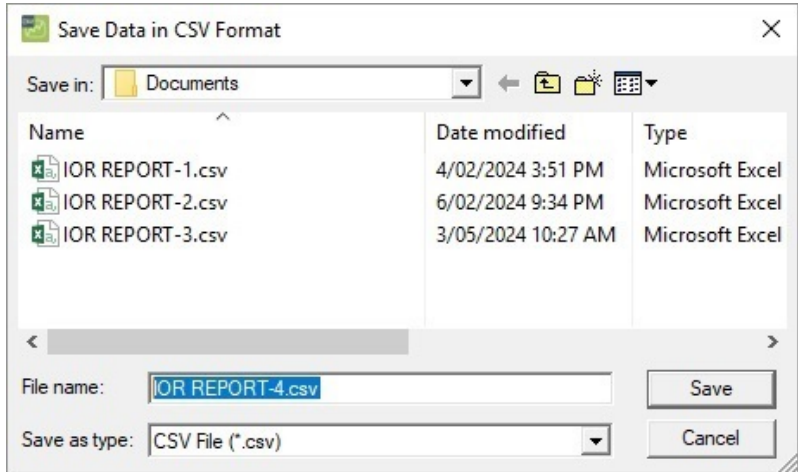


Figure 28 Save Data in CSV Format dialog box

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 rearranged as needed. An example of a DataMod CSV file opened in Excel is shown in Figure 29.

Delivery	Compartment	Exception	Date	Time	NET-V L	GRS-V L	T-AVE DEG	D-AVE KG/n	PRESET QTY	ACC
1	Report generated by DataMod tool - Configuration: "FIELD UNIT 1 - EAST BAY 01"									
2										
3	IOR ENERGY PTY LTD.									
4	EAST BAY 01 LOAD CONTROLLER - UNIT 1									
5	PRODUCT: STANDARD DIESEL									
6										
7	5 Used: 01	Status: Good	30/05/2024	Start: 17:53:40	2490.569	2510.5	---	---	---	02--
8	1	0	30/05/2024	End: 17:54:27	2490.569	2510.5	21.6	734.125	2500	---
9	4 Used: 02	Status: Good	30/05/2024	Start: 17:15:32	4907.825	4947.1	---	---	---	04--
10	1	0	30/05/2024	End: 17:16:28	2586.303	2607	21.6	734.125	2500	---
11	2	0	30/05/2024	End: 17:17:53	2321.522	2340.1	21.6	734.125	2300	---
12	3 Used: 01	Status: Good	30/05/2024	Start: 17:10:46	2582.037	2602.7	---	---	---	02--
13	1	0	30/05/2024	End: 17:11:29	2582.037	2602.7	21.6	734.125	2500	---
14	2 Used: 03	Status: Good	30/05/2024	Start: 16:51:21	6769.824	6824	---	---	---	03--
15	1	0	30/05/2024	End: 16:52:14	2073.209	2089.8	21.6	734.125	2000	---
16	2	0	30/05/2024	End: 16:53:36	2197.812	2215.4	21.6	734.125	2200	---
17	4	0	30/05/2024	End: 16:55:06	2498.803	2518.8	21.6	734.125	2500	---
18	1 Used: 01	Status: Excep	30/05/2024	Start: 16:33:30	49.603	50	---	---	---	01--
19	1	8	30/05/2024	End: 16:42:02	49.603	50	21.6	734.125	2000	---

Figure 29 Example of CSV file Opened in Excel

Custom Report Templates

Some users of the DataMod program may desire to go beyond the generic layout of the standard report in order to meet their specific requirements. In Load applications for example, a Bill of Lading style report may be required. The standard DataMod includes two Bill of Lading style reports, one for the 515-LP (Petroleum Volume Correction) and another for the 515-LC (standard) Load Control applications.

The following report template files (.fr3) can be found in the <installation directory>\custom folder (note default installation is C:\Contrec\500-DataMod\custom):

Template_LC_Multi.fr3 (for Standard Load Apps),
 Template_LP_Multi.fr3 (for Petroleum Load Apps) and
 Template_Plain.fr3 (the default report template).

Whether it is tailoring to the existing Load templates with company details and logo (as per the IOR examples below) or some other special customisation for another 515 application, Contrec can be contacted to arrange for the purchase of a custom Report Template designed to suit the specific requirements. After adequate details of the required report have been provided, a .fr3 Report Template will be supplied. It is recommended to save the template in the <installation directory>\custom folder.

Load a Custom Report Template

Use the Configuration menu to select the Report Template option as shown in Figure 30.

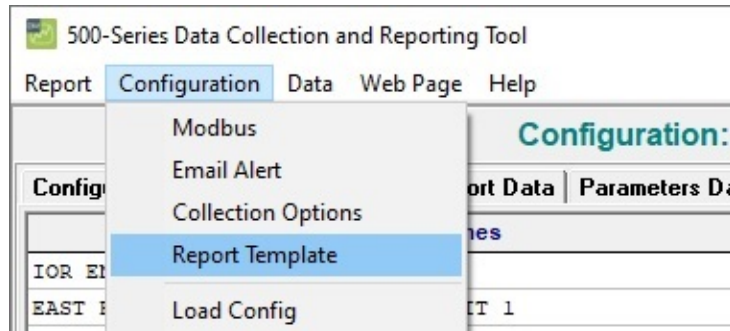


Figure 30 500 DataMod Configuration Menu - Report Template

The Load Report Template dialog box will open as shown in Figure 31. Select the appropriate folder and .fr3 report template file. This template will then be applied whenever the Generate Report function is used. It is also applicable for any Auto-Saved reports if the template was loaded before data collection started.

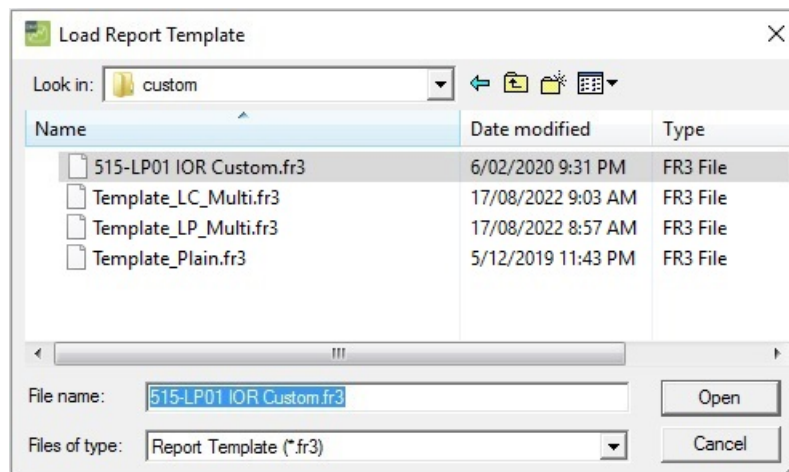


Figure 31 Load Report Template dialog box

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 or when an Auto-Saved report is generated. 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 32.

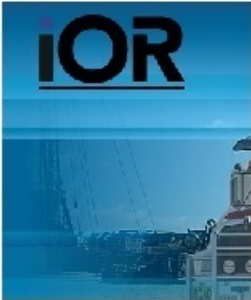
DELIVERY REPORT (IOR ENERGY PTY LTD)			
IOR ENERGY PTY LTD. EROMANGA CRUDE UNLOADING BAY		515 MODEL 1-1--F- LP01 INPUT F-TDP- 500-LP VERS 3 5 000 CUSTOM VERS 000006 UNIT-1 S/N 654321 UNIT TAG: BAY-001	
BS&W: test done			
TRANSACTION SUMMARY			
Log	"	00003	
Delivery	"	000005	
Record	"	00000100	
Compartments	"	Used: 01	
Exception	"	Status: Good	
Date	"	2024/04/24	
Time	"	Start: 18:58:37	
ACCESS CODE	"	03---	
JOB NUM	"	001835	
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	"	2024/04/24	
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 Contec 500-DataMod software. 25/04/2024 9:38:22 AM			
			Page 1

Figure 32 Single Compartment Transaction Report

Multiple Compartment Transaction Report

A custom multiple compartment transaction report is shown in Figure 33.

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 VESS 3 5 000
CUSTOM VESS 000 006
UNIT-1 S/R 654321
UNIT TAG: BAY-001

TRANSACTION SUMMARY

Log	"	00001
Delivery	"	000007
Record	"	0000140
Compartments	"	Used: 08
Exception	"	Status: Good
Date	"	2024/04/25
Time	"	Start: 09:07:04
ACCESS CODE	"	23--
JOB NUM	"	001742
SOURCE FIELD	"	18
TRANSP CODE	"	02
TRUCK REGO	"	TVR417
SUPPLY NUM	"	030278
FLUID GROUP	"	2
T-BASE DEG C	"	15.0
D-BASE KG/m3	"	781.870
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			

COMPARTMENT DATA (Continued)

Record	"	00000143	00000144
Compartments	"	04	06
Exception	"	00	00
Date	"	2024/04/25	2024/04/25
Time	"	End: 09:13:00	End: 09:16:07
T-AVE DEG C	"	25.3	25.1
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
2024/04/25	2024/04/25	2024/04/25	2024/04/25
End: 09:17:45	End: 09:19:14	End: 09:21:14	End: 09:23:21
25.6	25.2	25.3	25.4
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	2694.423

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

25/04/2024 9:32:06 AM

Figure 33 Multiple Compartment Transaction Report

Poll Multiple Instruments

Polling Overview

DataMod is designed to provide a very effective means to operate with installations of multiple 515 event based controllers (Load, Batch or Site Access applications). DataMod can poll controllers in turn to generate a report (transaction docket) and print automatically to the host computer's default A4 printer each time an operator or driver completes a transaction. There are significant cost savings and efficiency in allowing multiple controllers to have data collected and saved at a central point and to share the same office printer (if Windows default printer is off-line, the documents may be waiting to be printed in the spooling queue).

Polling is performed by loading in turn appropriate configurations (set as **Include into Polling List** and shown in coloured text), acquiring the last transaction number (LTN) and reading data if LTN is greater than the previously known LTN (used as a reference point). When polling is in progress, the list of Stored Records is reduced to show polling configuration records only.

In case of any failed communication during polling, the relevant configuration record will be marked in red colour (with the Last Poll Status line reflecting the nature of exception) and polling sequence will proceed to the next configuration.

Polling Sequence Details

Polling multiple units is performed as a cyclical process (continuously going over the list of relevant configurations) including the following stages:

Load Next Configuration

- Load next configuration (initially it starts with the first configuration in the list)
- Read unit type (checks communication with unit and unit type validity)
- Proceed to the next stage **Read LTN**

Read LTN (Last Transaction Number)

- Read Last Transaction Number and store it as the reference LTN if it has greater value
- Proceed to **Load Next Configuration** (i.e. skip to the next configuration) if it is the first polling cycle or first read after 'Fail' or LTN $\leq$ reference LTN, otherwise proceed to **Read LTN Data**

Read LTN Data

- Read LTN Data (unit tags and transaction values)
- Generate report
- Auto-save if enabled
- Auto-print if enabled
- Proceed to **Load Next Configuration** (i.e. start the next configuration cycle)

Authorisation Data

The **Authorisation Data** tab displays a screen that provides access to LoadPro's or 515 Secure Batcher's Modbus accessible Authorisation ID-Codes and the Compartment Load Values table in the LoadPro controllers.

Although in a LoadPro the Authorisation 1 and 2 IDs can be assigned to various roles, they are most commonly used where Authorisation 1 identifies and authorises drivers or operators and Authorisation 2 identifies and authorises the trucks/tankers that can be loaded from the controller. The first 10 Authorisation 2 Truck IDs have an associated Compartment Load Value table for the up to 18 compartments per ID.

An example of the **Authorisation Data** screen is shown in Figure 34.

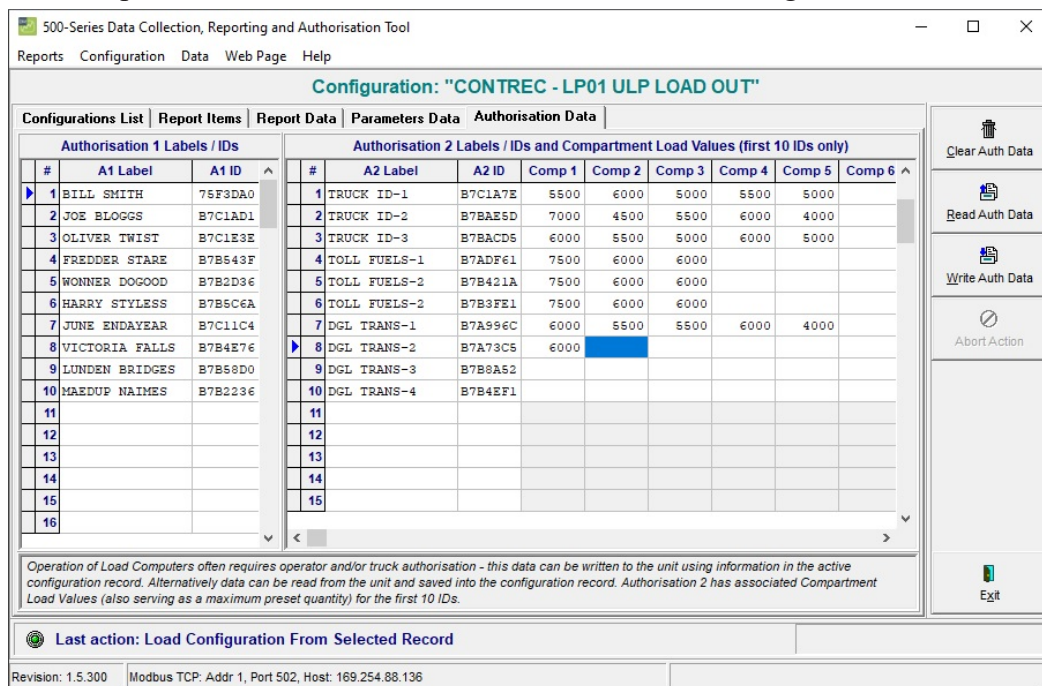


Figure 34 DataMod Authorisation Data tab

ID-Codes

The Authorisation ID-Codes in DataMod are accessed and displayed in the same order as the ID-Codes shown in the SETUP menu of the relevant instrument.

In a LoadPro load computer the access is to the 100 x Authorisation 1 and 100 x Authorisation 2 identification codes. In the load controller the type of ID-TYPE can be selected as:

- ID-TAG (last 7 hexadecimal characters read from an iButton Touch Key reader)
- ID-RFID (last 7 hexadecimal characters read from an RF proximity card reader)
- ID-PIN (5 digit number entered by the operator via the controller's front panel).

In a 515 Secure Batcher only the Authorisation 1 set of ID codes can be used and ID-PIN type is not available.

A Label or name can be independently entered for each Authorisation ID as required and saved as part of a stored configuration. The ID codes in the tables can be either freely entered to be written to the instrument or read back from the instrument and then saved as part of a stored configuration. Removing an ID code from a load controller after a load is completed can ensure the same ID codes are not incorrectly reused.

Compartment Load Values

In the LoadPro, Authorisation 2 has an associated Compartment Load Values table which can be used to hold the planned preset amount of product to be loaded into each compartment of a truck/tanker. The value can also serve as the maximum allowed safe fill quantity for each compartment. The operator or driver at the actual load controller can accept preset amount from the table or change to a lower value.

If an entry in the Compartment Load Value table is entered as zero or left blank, then the Load controller will use its own general Batch Limit and the last entered preset.

The table of Compartment Load Values only applies to the first 10 Authorisation 2 ID-Codes. Intended changes should be saved as part of a stored configuration.

Authorisation Screen Button Functions

The *Authorisation Data* tab button functions include:

- **Clear Auth Data** - Clears all the Name and Value fields in the displayed tables (does not clear any data in the instrument).
- **Read Auth Data** - Reads all of the Authorisation ID-Code locations in the instrument, plus the full Compartment Load Values table in the LoadPro controllers. Unused ID-Codes and load values are will remain blank in the DataMod table after reading from the instrument. This function reads ID-Codes and Compartment Load Values only (ID Labels are only user entered text held in DataMod).
- **Write Auth Data** - Writes the full block/s of 100 ID-Codes in the instrument, plus the full Compartment Load Value table in the LoadPro controllers. **IMPORTANT** - it is highly recommended to first READ the data from the instrument to populate the ID-Codes and Load Values with valid information before making any required changes and writing back, this is to ensure other codes/values in the data blocks are not accidentally cleared. Note that blank 'values' are written as zero and will clear any data in a particular position in the table.
- **Abort Action** - Aborts the Read or Write that may be in progress.

To keep an accurate record of the instrument's DataMod Authorisation data, remember to save any required changes in to the Configuration Record.