Drive by Download ™
Data Analysis Tool

Operation Manual

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Limited Warranty
Cirus Controls, LLC.

What and who is covered?

This warranty covers all defects in materials or workmanship in your Cirus Controls system under normal use, maintenance and service. This warranty coverage applies only to the original owner and is not transferable.

How long is the warranty period?

This warranty coverage runs for a period of 1 year from the date of initial installation (or 13 months from date of shipment from Cirus Controls), whichever occurs first. Replacement parts are warranted for the remaining portion of the original warranty period or thirty (30) days from date of shipment from our factory (whichever is greater).

How can you get service?

Cirus Controls' obligation under this warranty is limited to repairing and/or replacing, at Cirus Controls' option, any part or parts that are determined, by Cirus Controls, to be defective. To be eligible for any claim under this warranty, the owner (or Cirus authorized dealer) must return any defective part(s) to the factory, within the applicable warranty period (as set out above).

What will we do?

Cirus Controls' may, at its option, elect to grant adjustments in the field through an authorized representative and may thereby elect to waive the requirement that parts be returned to Cirus Controls' factory. The repair or replacement of defective parts under this warranty will be made without charge to the owner except for transportation of the part to our authorized repair location.

What is not covered under this warranty?

Cirus Controls will not assume any expense or liability for repairs made outside our plant without our prior written consent. We are not responsible for damage to any associated equipment or product and will not be liable for loss of profit or other special damages.

The provisions of this warranty do not apply to any product or parts which have been subject to misuse, negligence or accident, or which have been repaired or altered outside of Cirus Controls' factory in any way (in the judgment of Cirus Controls) so as to affect adversely its performance or reliability. Neither does this warranty apply to normal maintenance service and parts or to normal deterioration due to wear and exposure.

This warranty is expressly in lieu of other warranties, expressed or implied, in fact or by law, including any implied warranty of merchantability of fitness for a particular purpose. The remedies of repair or replacement as set forth are the only remedies under this warranty, Cirus Controls' disclaims any obligations or liability for loss of time, inconvenience, commercial loss or direct consequential, special or incidental damages. This warranty is in lieu of any other obligation or liability of Cirus Controls' of any nature whatsoever by reason of the manufacture, sale, lease or use of such products and Cirus Controls neither assumes, not authorizes anyone to assume for it, any other obligation or liability in connection with such products.

Revision Level of this Manual

Rev Letter	Effective Date	Contents
A	10/1/09	Pre-Release
B	10/15/09	First Release
C	10/20/10	Second Release
D	01/12/11	Third Release
E	03/09/11	Fourth Release
F	08/04/11	Fifth Release
G	12/23/11	Sixth Release

Cirus Controls reserves the right to make changes to this manual from time to time without notice.

Package Contents

Your ***Drive by Download ™*** Data Analysis system comes the following items:

- Installation CD for ***Drive By Download™***
- This manual;

Support

If you have any questions about your ***Drive by Download ™*** system or its operation, call the Cirus Controls Technical Support line at: (763) 493-9380.

Technical Support is available Monday thru Friday from 6:30 am to 5:00pm central time. You may also e-mail customer support with your questions at **info@ciruscontrols.com.**

Functional Overview

Data Analysis Tool is part of the ***Drive by Download ™*** software suite that manages the wireless data transfer of data from a truck mounted mobile data storage device to a base station computer.

Once the ***Drive by Download*** ™ data resides on a network or base station hard drive, you can use the ***Data Analysis Tool*** to run spreading reports, create shape files for GIS mapping, create .xls files in Excel© format and .csv format files for export to other programs. ***Data Analysis Tool*** combines the functions that were previously offered as two programs (Report.exe and ShapeMaker.exe).

Data Analysis Tool is a report writing device that does not modify the "log file" source data from which it creates reports. Cirus format log files are retained in their "as downloaded" state and can be "accessed" over and over with ***Data Analysis Tool*** for many different reporting needs.

Data Analysis Tool includes command line automation details for Windows Task Scheduler of automated report creation to run whenever the scheduler is set up to run.

Install Drive by Download ™ software on Windows© PC;

Click on the 'Data Management Suite.exe' file located on the Data Management Suite CD.

Creating Reports

Start Data Analysis Tool

Click the Data Analysis Icon (shown above) to start using Data Analysis Tool.

Data Analysis Tool Paths

The first time the program is opened, the tool will open to the main page (Figure 1).

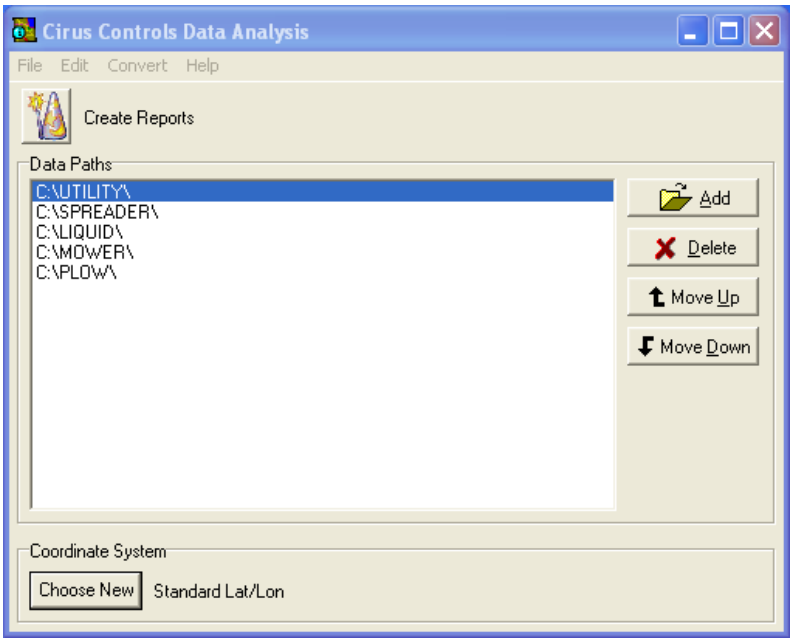


Figure 1

The data paths are the locations of the log file data that ***Drive By Download™*** has created. A data path is divided into two parts, the root path and the vehicle type. The root path is the folder where all of the log files are stored (in Figure 1 the root path is C:\). The vehicle type folder is named one of the following:

PLOW	UTILITY
SWEEPER	MOWER
BROOM	SPREADER
STRIPER	LIQUID
SUPERVISOR	WATER

The root path (Log file location) can be found in the bottom left corner of the ***Drive By Download™*** program (shown in Figure 2).

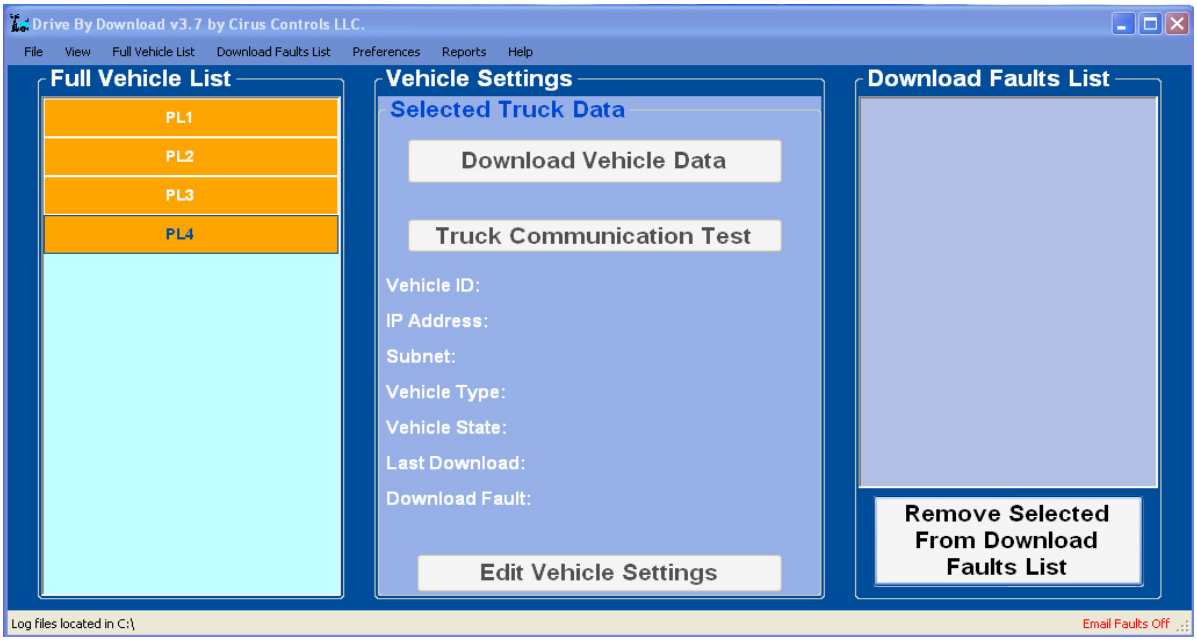


Figure 2

The program supports alternate coordinate systems which can be edited with the Choose New button in the Coordinate System box.

After the data paths have been added, click on the "wizard hat" to begin to run reports.
Note: Data Analysis Tool versions greater than v3.4 will automatically populate the data paths.

Select Date Range

Choose the date range of the report you wish to run. Date ranges can be chosen from the "select range" drop down menu or you can select the date from the start and end calendars.

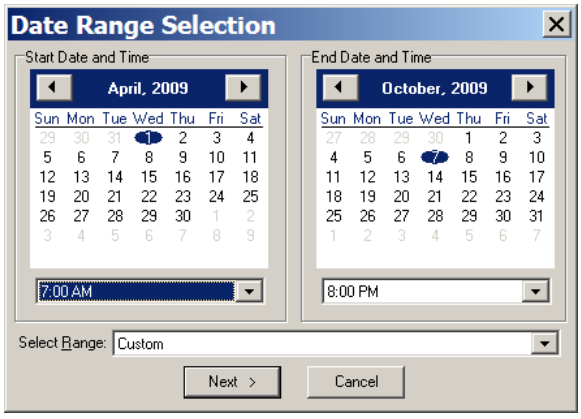


Figure 3

Select “next” when the date range of the report has been entered. Select Cancel to return to the start menu.

Vehicle Selection

Select the vehicles to create a report from in the Vehicle Selection screen (Figure 4). Check vehicles individually or check the master box to select or de-select all vehicles in the data path. Hit next to proceed.

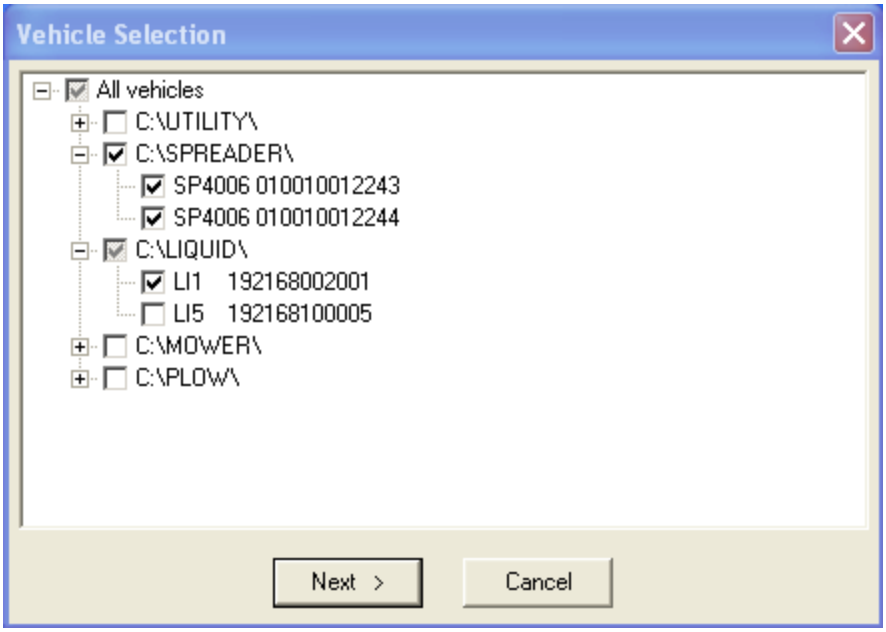


Figure 4

Report Selection

Make Selection(s) for Report (s) you wish to run (Figure 5).

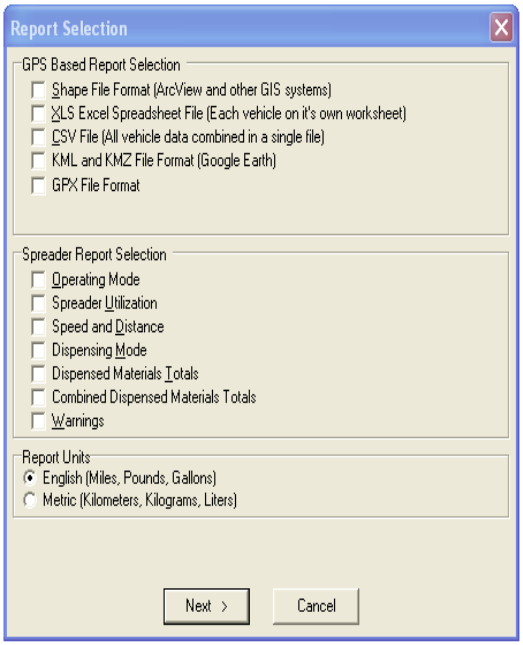


Figure 5

a) GPS Based Report Selection

This section combines GPS data with all other attribute data collected for the vehicle and creates the selected report. If no GPS antenna is attached to the vehicle, these reports will not have any mapping capability. All six file types are stored locally for future use.

i. Shape File format – creates three files for each report period (.shp; .shx, .dbf) and stores them in your designated file.
ii. XLS Excel Spreadsheet file with each vehicle on its own worksheet;
iii. CSV File with all vehicle data combined in a single file.
iv. KML and KMZ File Format (Google Earth) – creates a single KMZ and KML file which include the GPS/Spreading data for every truck.
v. GPX File Format – creates a GPX file.

b) Spreader Report Section

There are the seven standard reports that can be created.
-Operating Mode
-Spreader Utilization
-Speed and Distance
-Dispensing Mode
-Dispensed Material Totals
-Combined Dispensed Materials Totals
-Warnings

c) Report Units

The report can be run with the data labels in metric or English units. The English units are in miles, pounds and gallons. The metric units are in kilograms, kilometers and liters. This checkbox only adjusts the labels for the data units, it does not modify the data. To record data that is in metric or English units the spreader must be set accordingly.

Save Data Files

GPS Based Reports ask for the file to be saved. File names are automatically suggested with the beginning and ending dates from the files that were used in creating the report. For example, Figure 6 shows a file name of '101409 – 101509.xls' which means the report is from October 14, 2009 through October 15, 2009.

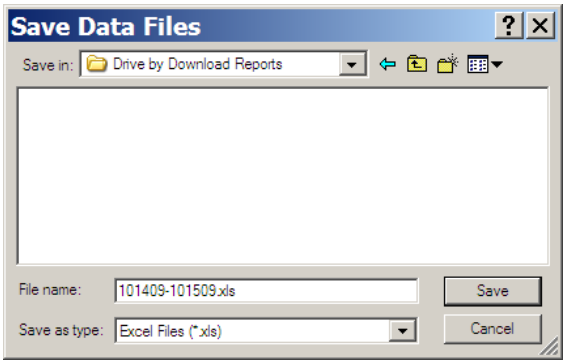


Figure 6

Data Errors – if you've chosen a date range with no data in it, or all of the data in the date range was recorded with the spreader in Manual mode, the message displayed in Figure 7 will appear.

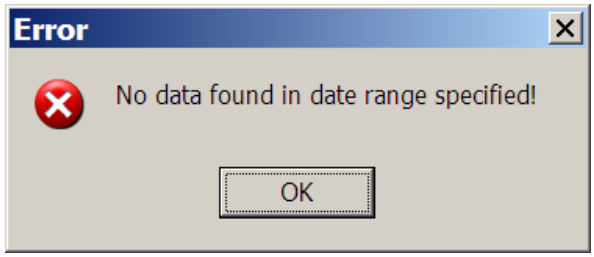


Figure 7

View the Report

The completed report (Figure 8) can be saved in a pdf format, but is not saved until you click "save" at the bottom of the page.

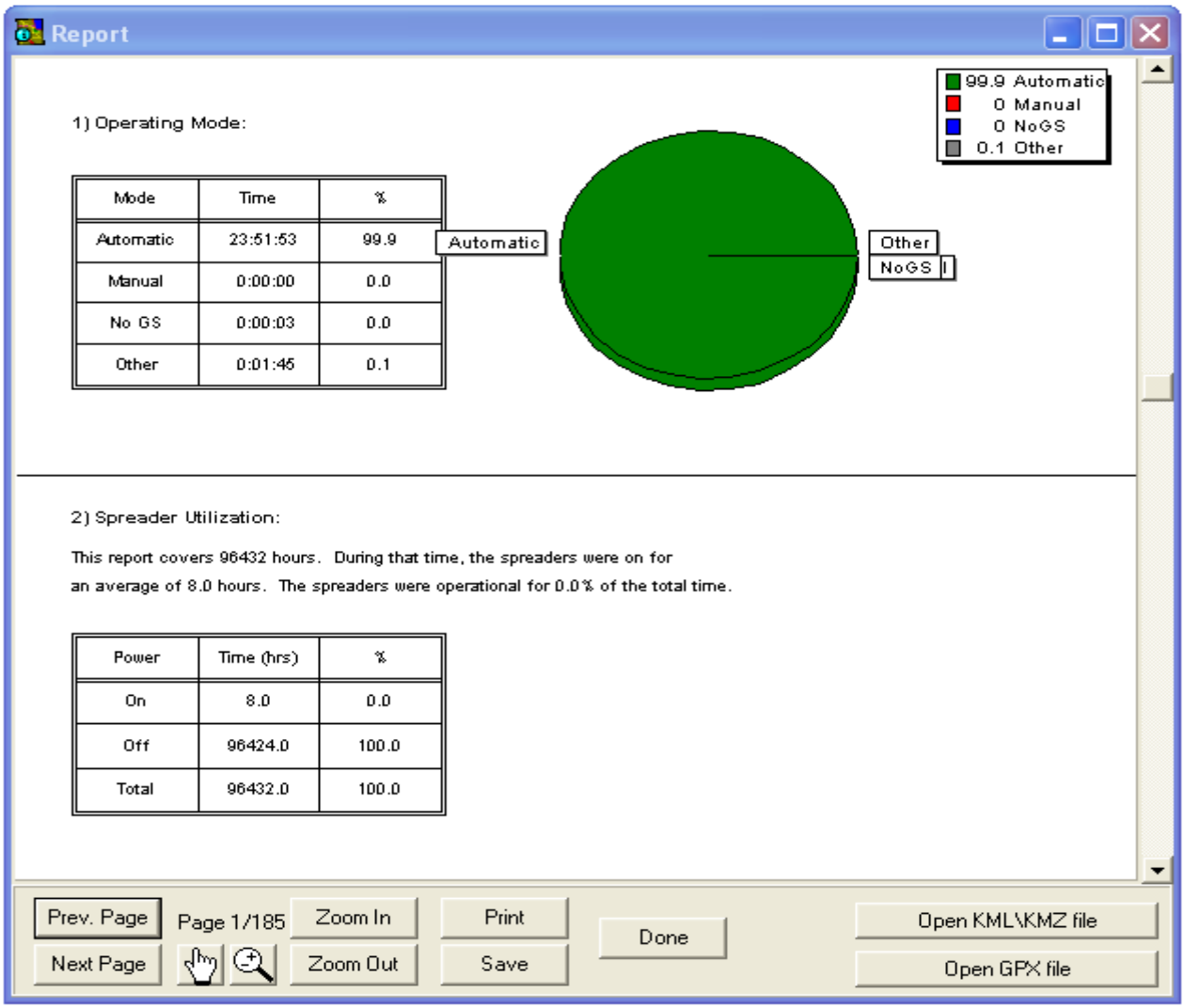


Figure 8

If a KML/KMZ or GPX file was created by checking the option in the Report Selection page, it can be viewed by clicking the buttons on the bottom right corner of the page labeled 'Open KML\KMZ file' or 'Open GPX file'. Note that for this function to work Google Earth (or an alternative program which opens KML, KMZ, or GPX files) must be installed on your computer and the file extensions must be associated with the program you wish to open the KML, KMZ, or GPX files.

Analyzing Data

Shape Files

Data Analysis Tool creates three files for each report period (.shp; .shx, .dbf). The shape files can be used to view the data the spreader has collected including vehicle speed, spreading rate, road temperature etc., at any of the time stamped locations on the map.

KML and KMZ Files

The KML and KMZ files contain a series of placemarks which can be imported into the Google Earth program. Each placemark can be used to view the data the spreader has collected including vehicle speed, spreading rate, road temperature etc., at any of the time stamped locations on the map.

GPX Files

The GPX file contains a series of route points which can be imported into mapping programs. Each route point can be used to view the latitude, longitude, time and truck name at any of the time stamped locations on the map.

Microsoft Excel and CSV Files

Excel or CSV (comma separated values) can be created by checking them in the report selection form (Figure 5). This provides the user with an alternative to shape files for viewing data. Some mapping software (i.e. Microsoft MapPoint) allows users to import GPS and truck spreading data via a CSV file. Excel and CSV files contain the following column headings:

Latitude
The GPS latitude point expressed as a decimal.

Longitude
The GPS longitude point expressed as a decimal.

Direction
GPS direction expressed in as a decimal in degrees (0 degrees is north, 180 degrees is south)

Date
The date the line of data was taken (MM/DD/YY)

Time
The time of day the line of data was taken(HH:MM:SS in military time)

Date_Time
The date and time of day expressed as a single entry (MM/DD/YY HH:MM:SS)

Truck_Name
The name of the truck the data was taken from.

Road_Temp
The temperature of the road in degrees Celsius or degrees Fahrenheit.

Air_Temp
The temperature of the air in degrees Celsius or degrees Fahrenheit.

Speed
The speed of the truck.

Distance
The distance traveled since the last timed log entry.

Mode
The operating mode the truck is in
AUTO – Automatic mode
MANU – Manual mode
NGSA – No Ground Speed Automatic(no ground speed mode with automatic mode available)
NGSM – No Ground Speed Manual(no ground speed mode with automatic mode not available, automatic mode is not available when the truck has been incorrectly calibrated/trimmed)
DUMP – Unload mode
SSTO – Storm/Season Total mode
HELP – Help mode
TEST – Test mode
MTRL – Material Change Mode
FILL- Fill Tanks Mode

Blast_Pass
The dispensing mode the spreader is in.
Normal, Blast, Pass

Granular
Describes the type of granular material being used (i.e. SAND).

Gran_Rate
Units: lbs./mi., lbs/lane mi.,kg/km, kg/lane km, or percentage of max trim
The value set in the spreader for granular.

Gran_Lbs
Units: lbs. or kg
The amount of granular dispensed since the last log entry

Meas_Gran
Units: lbs./mi., lbs/lane mi.,kg/km, or kg/lane km, or percentage of max trim
The actual rate the spreader is spreading granular at.

Spinner
Units: lanes*, or percentage of max trim*
Spinner rate.

Prewet
Describes the type of prewet material being used (i.e. BRINE).

PWet_Gals
Units: Gallons.
The amount of prewet dispensed since the last log entry.

Pwet_Rate
Units: Gal/Ton, Gal/Mile
The value set in the spreader for prewet.

Meas_Pwet
Units: Gal/Ton, Gal/Mile
The actual rate the spreader is spreading prewet at.

Anti_Ice
Describes the type of anti-ice material being used (i.e. KC12).

AI_Gals
Units: Gal/min.
The amount of anti-ice dispensed since the last log entry

Booms_On
Displays an L for left boom on, a C for center boom on, and an R for right boom on. If a boom is off it is replaced with a '-'.

AI_Rate
Units: Gal/min.
The value set in the spreader for anti-ice.

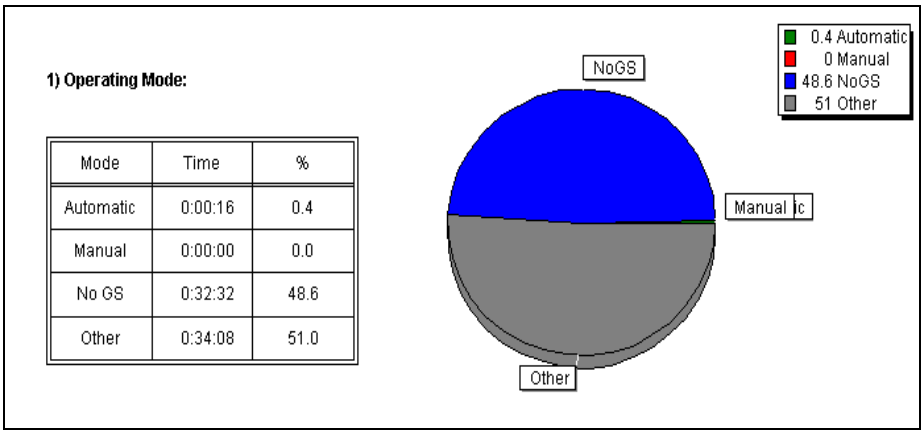
Meas_AI
Units: Gal/min.
The actual rate the spreader is dispensing anti-ice at.

Warning
Sensor error warnings.

The following is an overview of the sections included in a report.

Operating Mode

The duration of time, and the percentage of time, the spreader was in each operating mode while the spreader was on. This section distinguishes between the operating modes Automatic, Manual, No GS (No Ground Speed) and Other.

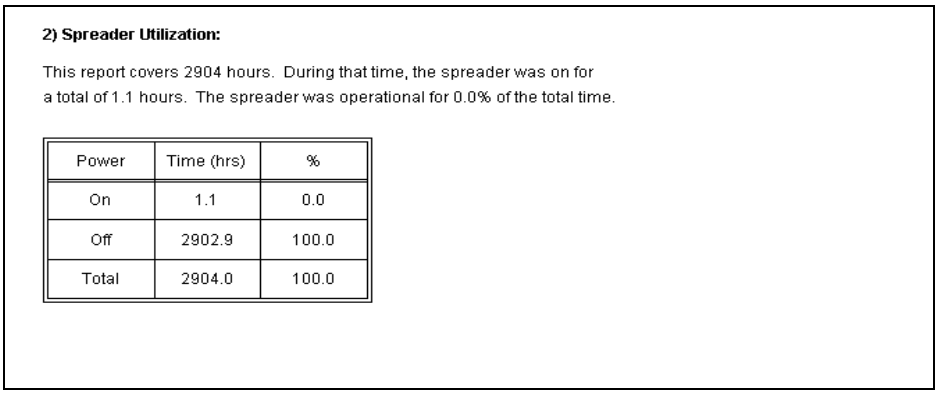


1) Operating Mode:

Mode	Time	%
Automatic	0:00:16	0.4
Manual	0:00:00	0.0
No GS	0:32:32	48.6
Other	0:34:08	51.0

Spreader Utilization

The number of hours the spreader was on and the percentage of time the spreader was operational over the time frame selected for the report.



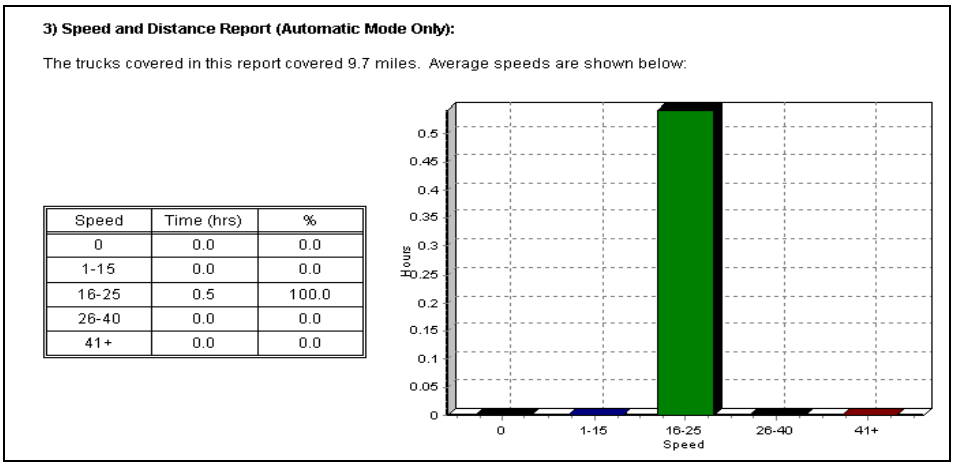
2) Spreader Utilization:

This report covers 2904 hours. During that time, the spreader was on for a total of 1.1 hours. The spreader was operational for 0.0% of the total time.

Power	Time (hrs)	%
On	1.1	0.0
Off	2902.9	100.0
Total	2904.0	100.0

Speed and Distance Report

The number of miles the truck covered over the time frame selected for the report.



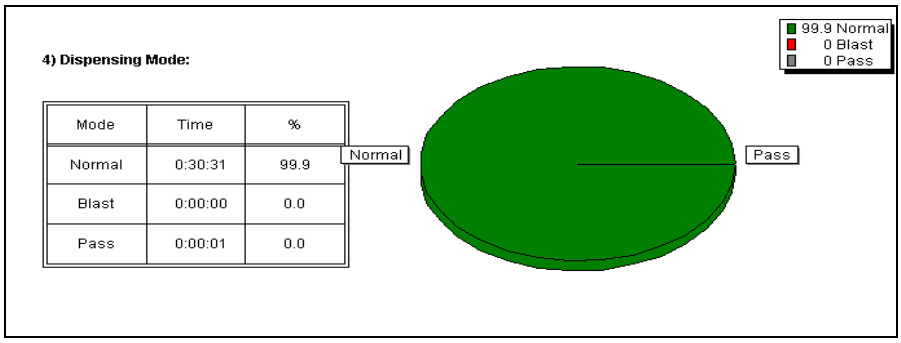
3) Speed and Distance Report (Automatic Mode Only):

The trucks covered in this report covered 9.7 miles. Average speeds are shown below:

Speed	Time (hrs)	%
0	0.0	0.0
1-15	0.0	0.0
16-25	0.5	100.0
26-40	0.0	0.0
41+	0.0	0.0

Dispensing Mode

The amount of time and the percentage of time each spreader was in each dispensing mode while the spreader was on. The dispensing modes are Normal, Blast, and Pass.

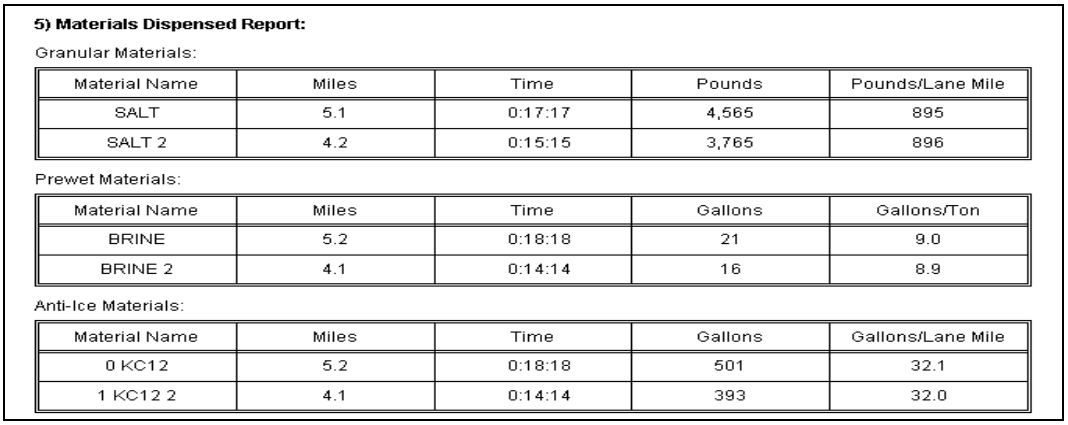


4) Dispensing Mode:

Mode	Time	%
Normal	0:30:31	99.9
Blast	0:00:00	0.0
Pass	0:00:01	0.0

Materials Dispensed Report

The miles driven while dispensing the material, the amount of time spent dispensing the material, the pounds/gallons of material dispensed and the rate the material was spread.



5) Materials Dispensed Report:

Granular Materials:

Material Name	Miles	Time	Pounds	Pounds/Lane Mile
SALT	5.1	0:17:17	4,565	895
SALT 2	4.2	0:15:15	3,765	896

Prewet Materials:

Material Name	Miles	Time	Gallons	Gallons/Ton
BRINE	5.2	0:18:18	21	9.0
BRINE 2	4.1	0:14:14	16	8.9

Anti-Ice Materials:

Material Name	Miles	Time	Gallons	Gallons/Lane Mile
0 KC12	5.2	0:18:18	501	32.1
1 KC12 2	4.1	0:14:14	393	32.0

Materials Dispensed Report (Combined Common Materials)
The miles driven while dispensing the common material, the amount of time spent dispensing the common material, the pounds/gallons of common material dispensed and the rate the common material was spread.

6) Materials Dispensed Report - Combined Common Materials:

Granular Materials:

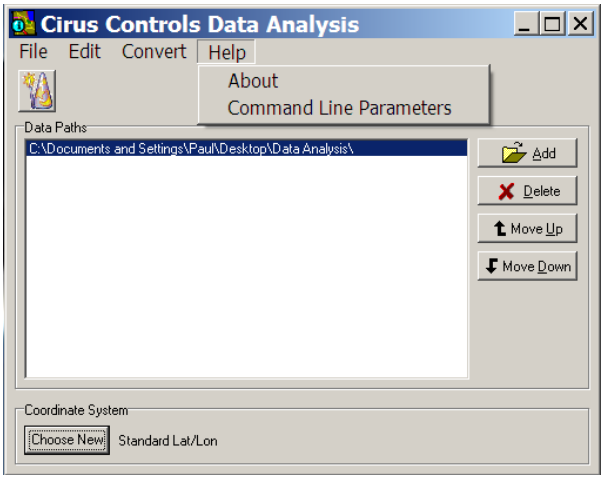
Material Name	Miles	Time	Pounds	Pounds/Lane Mile
SALT	9.3	0:32:32	8,330	895

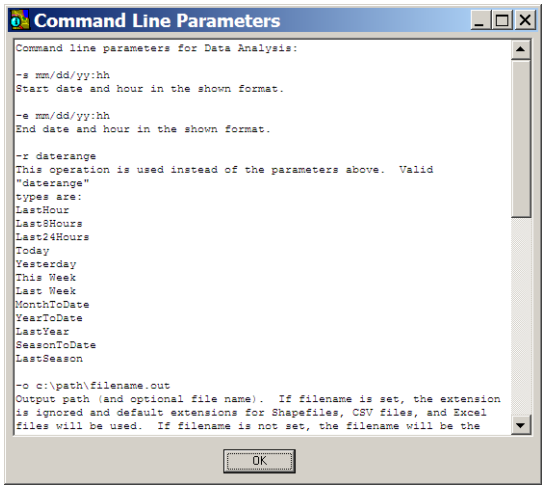
Prewet Materials:

Material Name	Miles	Time	Gallons	Gallons/Ton
BRINE	9.3	0:32:32	37	9.0

Automated Report Writing

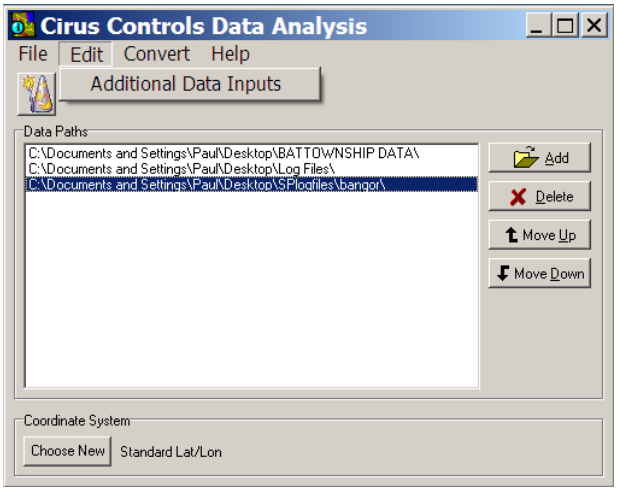
For fleet managers who want to see standard report parameters run automatically, ***Data Analysis Tool*** supports the Windows© Scheduler or directly using command line automation by following the format included with this program.

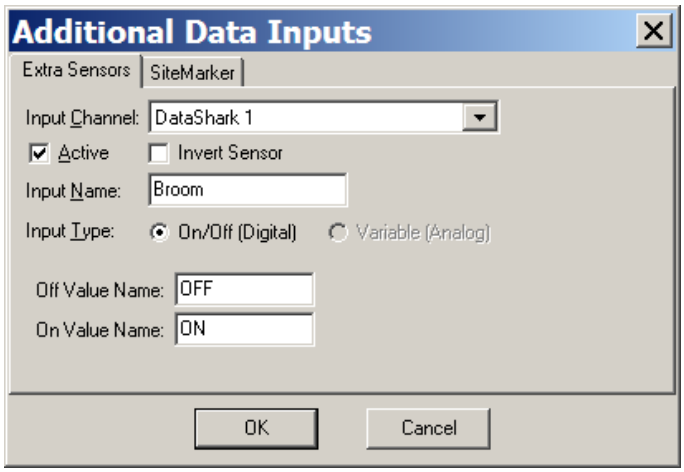




Assigning Names for Additional Data Inputs

When collecting data from a ***Data Shark***™ or from the ***Material Detection Module*** ™ (MDM) attached to a ***SpreadSmart Rx*** ™, the data inputs can be named specifically so the report formats have column headings that reference the feature for which the data is collected.





Drive by Download™ *Data Flow from Multiple Vehicles and Multiple Sites*