DESCARTES™

USER'S GUIDE

Descartes® Route Planner™

DataMaker and Analyzer

1.4

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1.0 Table of Contents

2.0 Introduction to DataMaker

DataMaker allows customers to capture key Descartes® Route Planner™ information in a simple format (spreadsheet). It provides validation of certain common issues and acts as a translation medium between the spreadsheet and the Descartes Route Planner application structured XML format.

Through the use of the aforementioned spreadsheet template and the DataMaker application described below, the process of collecting and loading customer data can be automated.

This document is split into the following sections:

- **Requirements/Assumptions** using the DataMaker toolset
- **High Level Process Workflow** describing the steps required to load data into Descartes Route Planner.
- **Performed by Descartes personnel** initially, but the customer will eventually become responsible for this.
  - The tool needs to be configured for each environment with which it can communicate. A profile is created for each environment and can be saved for easy access in the future. These profiles can be shared between users by copying the XML configuration file to the other machines.
- DataMaker Spreadsheet Template describing the components and format of the data to be imported.
- **Using DataMaker to** Stage and Validate Data describing the process to stage and validate the data for importing.
- Using **Using DataMaker** and Analyzer to perform the actual load of data into Descartes Route Planner.

2.1 Requirements/Assumptions

Data Keys

- Unique identifiers (keys) are used throughout the DataMaker Template. When specifying keys, the name of the key should not contain spaces. Analyzer by default will remove these spaces, an option can be used to maintain them however this runs the risk of encountering problems within Descartes Route Planner.
  - Correct example – ResourceKey = *Truck_D3_V1*
  - Incorrect example – ResourceKey = *Truck D3 V1*
- Special characters that should be avoided: &, `, ", /, \, <, >. By default, Analyzer will either encode them or remove them.

Data (Template) Value Columns

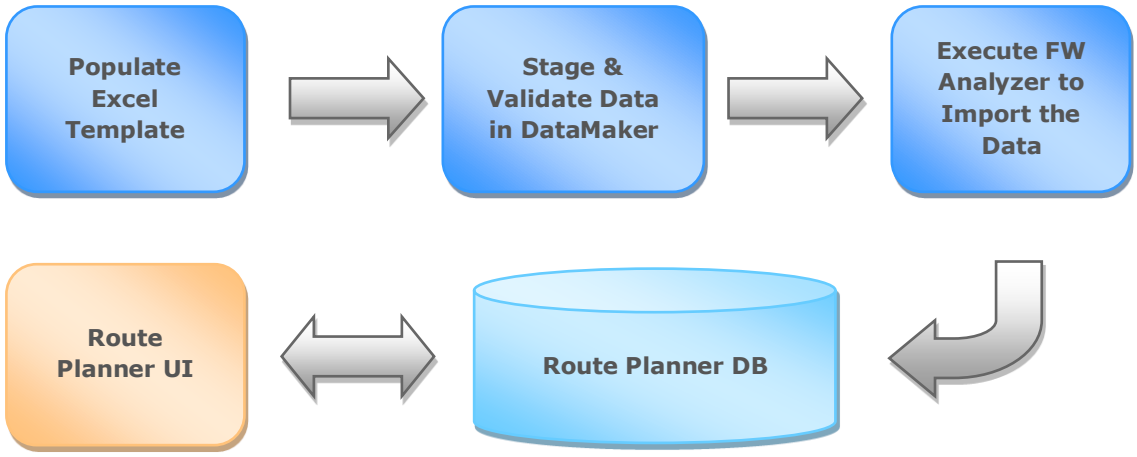
- Grey/White columns are *optional*.

- Orange columns are *required* either for structural or operational reasons.
- Yellow columns are *recommended* or may be required depending on the use of other columns.
- Green columns indicate a *sub-table*.
  - Example – the lat/long for a territory is a sub-table of the territory record

Schedules

- Input all schedule setting and populate all schedules where appropriate.

2.2 High Level Process Workflow



The workflow involves three primary steps:

1. Populate spreadsheet template.
   - The template is usually populated by the customer with the support of Descartes personnel to determine what fields are necessary and what data should be contained in each.
   - This can be a manual process, a scripted process or a combination of scripted and manual processes depending on the availability of required information.
2. Stage and validate data in DataMaker
   - Performed by Descartes personnel initially, but the customer will eventually become responsible for this.
   - The first step is to stage the data from the spreadsheet template into the DataMaker database. This process "imports" the data from the spreadsheet and populates the Import Tables in DataMaker.
   - The second step is to process the import tables into the Analyzer Tables, which restructures the data into a format that closely matches the XML structure utilized by Descartes Route Planner. It is the Analyzer Tables that

are read by the Analyzer utility to construct the XMLs and import data to Descartes Route Planner.

- The third step is to validate the data in the Import and Analyzer tables. This uses a series of queries to identify typical data problems in the form of missing, invalid or inconsistent information being provided.

3 Execute Analyzer to Import the data.

- Performed by Descartes personnel initially, but the customer will eventually become responsible for this.
- The tool needs to be configured for each environment with which it can communicate. A profile is created for each environment and can be saved for easy access in the future. These profiles can be shared between users by copying the XML configuration file to the other machines.

3.0 DataMaker Spreadsheet Template

The template is broken down into multiple worksheets. The following describes the purpose for each worksheet and the required data for each (orange cells).

3.1 Customer Order

A merging of the customer and order sheets. In most cases, customers do not use this sheet and use the separate customer and order sheets.

3.2 Customers

The customer ship to locations and associated data must be unique. For example, in the case where you have one customer with multiple Ship To values, the Customer Number must be unique for each customer location.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
Customer Number	Unique customer number. Corresponds to Pickup Location / Deliver Location on the Order tab and / or LocationRefNo on the Time Window Measures tab. E.g. Customer00001
Customer Name	Customer name or Company. E.g. Name00001
Address	First address line. E.g. 7316 WYNDHAM WAY
Address2	Second address line. Not used for geocoding, E.g. apartment number.
Cross Street	Name of Cross Street to Address. Eg. Smith Street
City	City of the address. E.g. WOODBURY
State_Province	State / Province of address. E.g. MN
Zip_Post Code	Zip/Post Code for address. E.g. 55125
Country	ISO 2 digit country code e.g. US, CA, etc
Territory_Zone	Territory / Zone if used. Must have a resource with a corresponding Territory / Zone in order to work. E.g. TC4
Parking Time	Setup / Parking incurred for each visit to the customer. Format hh:mm E.g. 00:10
Service Duration	Service duration when visiting this customer. Service Duration on order and order line are added to this number. Format hh:mm Eg. 00:12
Open	Earliest time customer can be serviced in format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted. E.g. 3/26/05 09:00
Close	Latest time customer can be serviced in format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted. E.g. 3/26/05 09:00
Latitude	Address Latitude in Decimal format:##.###### E.g. -24.567
Longitude	Address Longitude in Decimal format:##.###### E.g. 0.567

Requirements	Details any specific requirements a resource should be capable of meeting. If used, ensure that there are resources with matching Requirements. Concatenate multiple requirements using a Space. E.g. SmallTruck
ContactName	Name of contact at customer.
Phone	Customer Phone Number. E.g. 123456
UDFxxxxx(n)	User defined information for display in User Interface or to be sent to other applications. E.g. Collect cash. There are 9 strings, 3 integers, 3 floating point numbers.
Measure(n)Supplied	If "1" indicates load/unload rates should be utilized for measure#.
Measure(n)Recharge Rate	Indicates load/unload rates if measure#Supplied is 1. Units/second

3.3 Orders

An order is an activity that a driver will perform; e.g. pickup, delivery or double ended job:

- **Single ended job**
  - **Delivery -** The system assumes product is available at the initial or recharge location of the resource (truck/driver)
  - **Pickup -** The system assumes product is to be delivered at the final or recharge location of the resource (truck/driver)
- **Double ended job**
  - The pickup location specifies from where the product is coming. The delivery location specifies where the product is going. No assumptions are made. The two activities are linked and must be on the same route.
- **Multi Task Job**
  - These are currently supported by DataMaker for import only (not reservations). A multi-task order has three or more activities that are linked and must be on the same route. There can be only one delivery but there can be two or more pickups. Similar to the double-ended job, no assumptions are made regarding the product locations.
  - Each "leg" will have a set of columns dedicated to it, these are the same columns as a normal pickup leg but with a **_#** suffix. For example:
    - Pickup Location would be Pickup Location**_2**, Pickup Location**_3**, etc
    - PickupWindowClose would be PickupWindowClose**_2**, PickupWindowClose**_3**, etc
- **Itinerary Order**
  - These are not currently supported by DataMaker. These are orders where a double-ended order has been split into two or more legs using the Descartes Route Planner user interface. There is currently no interface to do this.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
Order Number	Unique order number. Can have duplicated order numbers if using Order Line Number. E.g. Order00001
Type	Specifies type of order. Options are: • DELIVERY • PICKUP • PICKUP/DELIVERY • MultiTask
Pre Service Duration	Setup / Parking incurred for this order Format hh:mm E.g. 00:10
Pickup Service Duration	Service duration for Pickup (Pickup/Delivery Orders) Format hh:mm E.g. 00:15 **Note**: this only applies to double-ended orders.
Delivery Service Duration	Service duration for Delivery (Pickup/Delivery Orders) Format hh:mm E.g. 00:15 **Note**: this only applies to double-ended orders.
Order Service Duration	Service duration per **Order** Format hh:mm E.g. 00:15
Pickup Pre Service Duration	Setup / Parking incurred for Pickup (Pickup/Delivery Orders) Format hh:mm E.g. 00:15 **Note**: this only applies to double-ended orders.
Delivery Pre Service Duration	Setup / Parking incurred for Delivery (Pickup/Delivery Orders) Format hh:mm E.g. 00:15 **Note**: this only applies to double-ended orders.
Pickup Location	Should correspond to a Depot Number or Customer Number E.g. Customer00001, required if using pickups
Earliest Pickup	Earliest pickup time in format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 3/26/05 09:00, required if using pickups
Latest Pickup	Latest pickup time in format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 03/26/05 11:00, required if using pickups
Delivery Location	Should correspond to a Depot Number or Customer Number E.g. Customer00001
Earliest Delivery	Earliest delivery time in format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 3/26/05 12:00
Latest Delivery	Latest delivery time in format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 03/26/05 15:00
Pickup Window Type	If Schedule.hardWindow=2 "Depart"=Hard window, order must complete within this window. "Arrive"=Soft window, order must arrive within this window
Delivery Window Type	If Schedule.hardWindow=2 "Depart"=Hard window, order must complete within this window. "Arrive"=Soft window, order must arrive within this window
Pickup Window Open	Open Date and Time for **pickup** customer, used for customers windows that are **continuous** (e.g. 11pm Monday to 3am Wednesday) format mm/dd/yy HH:mm:ss Date can be omitted if using FW Analyzer to create dates. E.g. 3/26/05 12:00
Pickup Window Close	Close Date and Time for **pickup** customer, used for customers windows that are **continuous** (e.g. 11pm Monday to 3am Wednesday) Latest delivery time in format mm/dd/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 03/26/05 15:00

Delivery Window Open	Open Date and Time for **delivery** customer, used for customers windows that are **continuous** (e.g. 11pm Monday to 3am Wednesday) format mm/dd/yy HH:mm:ss Date can be omitted if using FW Analyzer to create dates. E.g. 3/26/05 12:00
Delivery Window Close	Close Date and Time for **delivery** customer, used for customers windows that are **continuous** (e.g. 11pm Monday to 3am Wednesday) Latest delivery time in format mm/dd/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 03/26/05 15:00
Order Line Number	Line: Used in conjunction with Order Number to specify multiple order lines on a single order. All "line" fields (green heading) are unique per line, all other fields should have duplicated values. This field must be unique per order.
Item Description	Line: Description of the item / service on this order line E.g. 24 Cans Soda
Quantity	Line: Quantity of items. Use 1 as default. E.g. 2
Measure(n)	Line: Measures can be defined as Weight, Volume, Cases etc. Corresponds to Measure# capacity on your resources. E.g. 150
Service Duration	Line: Service duration per Order **Line** Format hh:mm E.g. 00:15
Requirements	Line: Details any specific requirements a resource should be capable of meeting. If used, ensure that there are resources with matching Requirements. Concatenate multiple requirements using a Space. E.g. SmallTruck
HazMatType	Line: if "1" indicates hazmat restrictions should be utilized, null or 0 if not.
ProductTypeKey	Line: Specifies a **ProductType** to associate to the line. Product types contain measure, requirement, service duration, etc definitions.
Commodities	Line: Defines a commodity associated with the line. Commodities are compared to the commodity rule to determine whether products can co-exist on a truck. Concatenate multiple commodities using a space. E.g. Poison Explosive
Territory_Zone	Territory / Zone if used. Must have a resource with a corresponding Territory / Zone in order to work. E.g. TC4
Planned Route	Route on which Order originally planned - used for building base case. E.g. Route1-20050512, will populate as PreferredResource.
Route Position	Position on Route where Order was originally planned - used for building base case. E.g. 4. Numbers can be skipped or duplicated however this will show as an error in the validation process but can be ignored if intentional.
Pickup Route Position	For a double-ended order, indicates the position of the pickup, may not match the delivery.
Delivery Route Position	For a double-ended order, indicates the position of the delivery, may not match the pickup.
Interspersable	Determines if Pickup and DropOff activities of double ended jobs need to occur sequentially or not. E.g. 1
UDFxxxxx(n)	User defined information for display in User Interface or to be sent to other applications. E.g. Collect cash. There are 9 strings, 3 integers, 3 floating point numbers.
Pickup Window Variation	"Fudge Factor" for **pickup** timewindow, does not incur incremental penalty, profit is multiplied by **VariationProfitFactor** to determine eligible profit, if viewed as a penalty it is (1-Factor)*Profit, applies to both sides of the window.
Delivery Window Variation	"Fudge Factor" for **delivery** timewindow, does not incur incremental penalty, profit is multiplied by **VariationProfitFactor** to determine eligible profit, if viewed as a penalty it is (1-Factor)*Profit, applies to both sides of the window.

Variation Profit Factor	When a variation window is provided, determines the profit change for delivery during the window. Profit gained is Profit*Factor, if viewed as a penalty the cost is (1-Factor)*Profit
MasterRoute	If "1" loads to master route mode, if 0 or null load to routing mode.
Available Date	For single-ended orders, determines when the product is available to load onto the truck. Resource Earliest Start Date must be after this date.
Available Time	For single-ended orders, determines when the product is available to load onto the truck. Resource Earliest Start Date must be after this time.
MasterRoute	If "1" loads to master route mode, if 0 or null load to routing mode.

3.4 Depots

Defines the depots, origins and recharge points.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
Depot ID	Unique depot identifier. Corresponds to Pickup Location / Deliver Location on the Order tab and / or Start Location / End Location on the Resource tab. E.g. Depot01
Depot Name	Depot name. E.g. Depot01
Address	First address line. E.g. 12600 West Frontage Road
Address2	Second address line, not geocoded. E.g. apartment 1
Cross Street	Name of Cross Street to Address. Eg. Smith Street
City	City of the address. E.g. Burnsville
State / Province	State / Province of address. E.g. MN
Zip / Post Code	Zip/Post Code for address. E.g. 55337
Country	ISO 2 digit country code e.g. US, CA, etc
Parking Time	Setup / Parking time incurred for each visit to the depot. Format hh:mm E.g. 10
Service Duration	Service duration when visiting this depot. Service Duration on order and order line are added to this number. Format hh:mm E.g. 00:15
Latitude	Address Latitude in Decimal format:##.###### E.g. -24.567
Longitude	Address Longitude in Decimal format:##.###### E.g. 0.567
Territory / Zone	Territory / Zone if used. Must have a resource with a corresponding Territory / Zone in order to work. E.g. TC4
Recharge	Turns on Recharging for the depot. Options are 0 and 1, if 1 enables the feature.
Recharge Duration	Length of time taken for recharge. Format hh:mm E.g. 00:45
Earliest Recharge	Earliest time recharge can occur. Format hh:mm E.g. 11:15
Latest Recharge	Latest time recharge can occur. Format hh:mm E.g. 13:15
Open	Earliest time depot is in operation. Format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted. E.g. 3/26/05 09:00
Close	Latest time depot is in operation. Format mm/dd/yy HH:mm or dd/mm/yy HH:mm Date can be omitted. E.g. 3/26/05 09:00
UDFxxxxx(n)	User defined information for display in User Interface or to be sent to other applications. E.g. Collect cash. There are 9 strings, 3 integers, 3 floating point numbers.

Measure(n)Supplied	If "1" indicates load/unload rates should be utilized for measure#.
Measure(n)RechargeRate	Indicates load/unload rates if measure#Supplied is 1. Units/second
Requirements	Details any specific requirements a resource should be capable of meeting. If used, ensure that there are resources with matching Requirements. Concatenate multiple requirements using a Space. E.g. SmallTruck
ContactName	Name of contact at customer.
ContactPhone	Customer Phone Number. E.g. 123456
GeoCodePolicy	Determines geocoding rules, typically 2 which indicates lat/long should be geocoded unless provided.
Comment	Comments to associate with depot.

3.5 Resources

A resource is a truck and driver combination available to do work for a period of time (i.e. a route).

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
ResourceKey	Unique vehicle identifier. E.g. Truck_D3_V1
Name	Vehicle Description. E.g. Ford F160
Start Location	Vehicle starting location. Must correspond to a Customer Number or Depot ID E.g. Depot01
End Location	Vehicle ending location. Must correspond to a Customer Number or Depot ID E.g. Depot01
Territory	Territory / Zone if used. Must have a customer with a corresponding Territory / Zone in order to work. E.g. TC4
Measure(n)	Vehicle capacity measure defined as Weight, Volume, Cases etc. Corresponds to Measure# capacity on your orders. E.g. 3500
Pre-Service Duration	Service duration incurred prior to each order. Format hh:mm E.g. 00:10
Post-Service Duration	Service duration incurred after each order. Format hh:mm E.g. 00:15
MaxElapsedDuration	Maximum service duration from shift start to end in Format hh:mm E.g. 08:30
Requirements	Details any specific requirements a resource should be capable of meeting for orders. If used, ensure that there are orders with matching Requirements. Concatenate multiple requirements using a Space. E.g. SmallTruck
Commodities	Defines a commodity associated with the line. Commodities are compared to the commodity rule to determine whether products can co-exist on a truck. Concatenate multiple commodities using a space. E.g. Poison Explosive
EarliestStartDate	**Earliest** time vehicle **departs** Start Location in format mm/dd/yy HH:mm or dd/mm/yy HH:mm E.g. 3/26/05 07:00
EarliestServiceDate	**Earliest** time vehicle can **service** a customer in format mm/dd/yy HH:mm or dd/mm/yy HH:mm E.g. 3/26/05 08:00

EarliestEndDate	**Earliest** time vehicle **returns** to End Location in format mm/dd/yy HH:mm or dd/mm/yy HH:mm E.g. 3/26/05 15:00
LatestStartDate	**Latest** time vehicle **departs** Start Location in format mm/dd/yy HH:mm or dd/mm/yy HH:mm E.g. 3/26/05 08:00
LatestServiceDate	**Latest** time vehicle can **service** a customer in format mm/dd/yy HH:mm or dd/mm/yy HH:mm E.g. 3/26/05 18:00
LatestEndDate	**Latest** time vehicle **returns** to End Location in format mm/dd/yy HH:mm or dd/mm/yy HH:mm E.g. 3/26/05 19:00
MaxStops	Max stops the vehicle can make on a route. E.g. 25
MaxDistance	Max distance the vehicle can travel on a route. E.g. 200
MaxDrivingTimeBeforeBreak	Maximum driving time before vehicle must take a break. Format hh:mm E.g. 04:30
MaxElapsedTimeBeforeBreak	Maximum elapsed time before vehicle must take a break. Format hh:mm E.g. 06:00
BreakDuration	Break duration Format hh:mm E.g. 0:45
MaxNumberOfBreaks	Maximum number of breaks that the vehicle can take. E.g. 2
MaxDrivingTimeBeforeRest	Maximum driving time before vehicle must take a rest. Format hh:mm E.g. 09:00
MaxElapsedTimeBeforeRest	Maximum elapsed time before vehicle must take a rest. Format hh:mm E.g. 12:00
RestDuration	Rest Duration Format hh:mm E.g. 12:00
BreakTimeOnDutyInd	Determines if time spent on break is counted as elapsed time between rests. E.g. 1 for Yes, 0 for No
DriverKey	A unique identifier which identifies the Driver / Mobile Device ID to be used for this route. E.g. 44001
SpeedFactor	Factor to adjust the travel speed of the resource. E.g. 0.95
ServiceSpeedFactor	Factor to adjust the service duration at the customer. E.g. 0.95
Description	General description of the vehicle E.g. 1995 Ford F700
TractorKey	Vehicle identifier (Registration / Fleet number) E.G. WD075L
Work(n)Penalty	Penalty incurred per second when using the resource during the duration period up to Work#Duration. E.g. 0.001
Work(n)Duration	Duration period in which Work#Penalty is incurred for the resource. Duration is determined from Resource start. Format hh:mm E.g. 2:00
LastDateWorked	Last Date Driver worked. Used for DOT Hours of Service rules. E.g. 11/23/2006
WorkWeekLength	Length of the work Week in DOT rules. US is 7 or 8 days. E.g. 7
WorkWeekLimit	Maximum number of hours a driver may work in the WorkWeekLength. Format hh:mm E.g. 70:00
WeeklyRestLength	Specifies the rest required by the driver once the WorkWeekLimit has been reached by the driver. Format hh:mm E.g. 34:00
WorkWeekResetTime	Specifies the time of day that the work week resets / starts. Format hh:mm E.g. 06:00
WorkWeekHistory(n)	Number of hours worked by the driver on his last day worked. Format hh:mm E.g. 11:23
Measure(n)Recharge Rate	Indicates load/unload rates if location has measure#Supplied is 1. Units/second

UDFxxxxx(n)	User defined information for display in User Interface or to be sent to other applications. E.g. Collect cash. There are 9 strings, 3 integers, 3 floating point numbers.
RPProfileKey	Links to routing RPProfile tab to associate a set of routing parameters to the resource.
TruckKey	Truck to associate to the Resource.
TrailerKey	Trailer to associate to the Resource.
FullThreshold	Threshold to determine complete full bonus or partial full penalty.
CompleteFullBonus	**Bonus** for truck having ALL measures **above** the full threshold
PartialFullPenalty	**Penalty** for truck having ALL measures **below** the full threshold
Service Duration	Service duration when visiting this depot. Service Duration on order and order line are added to this number. Format hh:mm E.g. 00:15
SameStopBonus	Bonus to apply if more than 1 stop associated with the same GeoStop
MissedWindowPenalty	Penalty for beginning late at a stop (per second)
WaitTimePenalty	Additional penalty to incur (above working cost) for waiting.
ServicePenalty	Penalty incurred when the first stop is assigned to a route.
DiscountInitialLeg	Discounted cost for working/driving between depot and first stop.
DiscountFinalLeg	Discounted cost for working/driving between last stop and depot.
MinTravelDistance	Maximum distance a resource can travel and be considered the same stop (Schedule.NewStop=3 only)
LatestEndPenalty	Penalty for arriving at depot after Latest End Date
Weight	Maximum weight in KG
Height	Height of Truck in Meters
Width	Width of Truck in Meters
Length	Length of Truck in Meters
StartupTime	Time the Resource spends at depot before departing.
WindupTime	Time the Resources spends at depot after returning.
SkipInitialLoadTime	If 1 the service time for pickup (complex) at the depot at the start of the day will not be counted.
IgnoreAssetMeasures	If 1 the measures defined at the asset will be ignored and will use the resource values instead.
CommercialTruck	If 1 will use commercial routing rules with an external pather (lmb ignores this flag)
MasterFrequency	List of days to associate to the master frequency when generating routes, only used by master routes.
FirstSTopThreshold	Resting rule - see admin guide for details
AllowEarlyRest	Resting rule - see admin guide for details
EarlyRestTimeThreshold	Resting rule - see admin guide for details
EarlyRestWaitThreshold	Resting rule - see admin guide for details

UseFullWaitAsRestInd	Resting rule - see admin guide for details
OpportunisticEarlyRest	Resting rule - see admin guide for details
MasterRoute	If "1" loads to master route mode, if 0 or null load to routing mode.

3.6 Routing Parameters

Routing parameters provide the speed and cost structure that the optimizer uses for pathing decisions. One entry per resource is required, this has largely been replaced by the Descartes Route Planner profile sheet.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
ResourceKey	ResourceKey which must correspond to the ResourceKey on Resource Tab of this Workbook. E.g. Truck0001
RouteParmsKey	Routing Parameter Key - must exist in Fleetwise. E.g. RoadCost_Set10
StartDate	Start Date and Time for the Routing parameter. Format yyyy-MM-ddTHH:mm:ss Eg. 2006-01-15T14:00:00. NOTE: Descartes Route Planner 10.x and later, only time value is required.
EndDate	End Date and Time for the Routing parameter. Format yyyy-MM-ddTHH:mm:ss Eg. 2006-01-15T14:00:00. NOTE: Descartes Route Planner 10.x and later, only time value is required.

3.7 Time Window Measures

Time window measures are used to define multiple time windows or additional details for the time windows, e.g. Variations. This tab is only used when the checkbox **Use Window Measures** is enabled in the DataMaker application.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
LocationRefNo	Unique Location (customer) number. Corresponds to Pickup Location / Deliver Location on the Order tab and / or Start Location / End Location on the Resource tab. E.g. Customer00001
BOLNumber	Unique order number. Can have duplicated order numbers if using multiple Time Windows. E.g. Order00001
XType	Specifies type of order. Options are- DELIVERY - PICKUP E.g. DELIVERY
EarliestTime	Earliest delivery time in format HH:mm E.g. 3/26/05 12:00
LatestTime	Latest delivery time in format HH:mm E.g. 3/26/05 12:00
EarliestDate	Earliest delivery date in format mm/dd/yy or dd/mm/yy E.g. 03/26/05
LatestDate	Latest delivery date in format mm/dd/yy or dd/mm/yy E.g. 03/26/05
VariationDuration	Amount of time the task can vary from the time windows. Format hh:mm E.g. 00:05

VariationProfitFactor	Portion of the task profit maintained when it is served outside the defined time window, but within the allowed variation. E.g. 0.85
ProfitFactor	Portion of the job or tasks profit gained by serving it within the time window. E.g. 0.95
WindowType	If Schedule.hardWindow=2 "Depart"=Hard window, order must complete within this window. "Arrive"=Soft window, order must arrive within this window
Measure(n)	Measures can be defined as Weight, Volume, Cases etc. Corresponds to Measure1 capacity on your resources. Specific to this Time Window E.g. 150
Frequency	The list of days used to build a time window. Valid days areMTWRFSU
Window Open	Open Date and Time for customer, used for customers windows that are **continuous** (e.g. 11pm Monday to 3am Wednesday) format mm/dd/yy HH:mm:ss Date can be omitted if using FW Analyzer to create dates. E.g. 3/26/05 12:00
Window Close	Close Date and Time for customer, used for customers windows that are **continuous** (e.g. 11pm Monday to 3am Wednesday) Latest delivery time in format mm/dd/yy HH:mm Date can be omitted if using FW Analyzer to create dates. E.g. 03/26/05 15:00

3.8 Descartes Route Planner Profile

Descartes Route Planner profiles are a set of routing parameters with times in use that can be assigned to a resource or route template.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
ProfileKey	Unique identifier for group of routing parameters, this does not exist in Descartes Route Planner and is referenced on the resource and route template sheets.
RouteParmsKey	Routing Parameter Key - must exist in Fleetwise. E.g. RoadCost_Set10
StartDate	Start Date and Time for the Routing parameter. Format yyyy-MM-ddTHH:mm:ss Eg. 2006-01-15T14:00:00. NOTE: Descartes Route Planner 10.x and later, only time value is required.
EndDate	End Date and Time for the Routing parameter. Format yyyy-MM-ddTHH:mm:ss Eg. 2006-01-15T14:00:00. NOTE: Descartes Route Planner 10.x and later, only time value is required.

3.9 Schedule

Schedules are a grouping of routes and orders by customer geographical or functional purposes.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
ScheduleTemplateKey	Must Exist in FW prior to loading
Type	2=Planning 3=Execution
DistanceUnits	Indicates if the distances are in mi or km
ScheduleEndDate	Typically blank, routes/orders past this date will not be optimized

IgnoreEmptyRoutes Ind	If enabled RMPI will exclude empty routes when performing inter optimization. 1 Enables setting 0 Disables setting
ConsolidateStops	Determines if the task's time windows are evaluated when the ConsolidateStops schedule setting is set to 2. Applies to all tasks for the job. True (1) Task's time window is ignored if it is scheduled immediately after another task at the same location with the same time window. False (0) Task's time window is evaluated
NewStop	Determines what constitutes a new stop and how task lines are numbered in the Schedules Section of the Outline View. See Route Node Contents. 0 Every task is always a new stop. 1 Every task for a different customer is a new stop, even if they are at the same location. Tasks for the same customer are assigned the same stop number. 2 Every task at a new location is a new stop. Tasks at the same location, even for different customer IDs, are assigned the same stop number. 3 Tasks for locations within the resource's MinTravelDistanceInFeet setting are considered the same stop.
RechargeInd	Determines if Resources may return to a depot in the middle of a route. Depots need to have Recharging Enabled. True (1) Resources may return to a depot in the middle of a route to refill when empty, or drop off contents when full. Occurs only at depot whose Recharge property is set to true (1). False (0) Resources may not return to a depot in the middle of a route.
MaxRechargeDepots ToTry	Maximum number of depots (closest) to consider when determining recharges. Affects performance when pathing when large number of depots are available. Recommended value3
AllowEarlyRecharge	Enables whether Early Recharges are allowed (Descartes Route Planner 10.2 or higher)
PreRouteInd	Determines if pre-routing is used. True (1) Optimizer uses pre-routing. False (0) Optimizer does not use pre-routing.
ExchangeRouteInd	Determines whether routes are exchanged during inter optimization. This is useful when there are multiple routes at the same depot with different costs. Routes are not re-sequenced when exchanging. True (1) Optimizer will attempt to swap entire routes between any pair of eligible resources (in accordance with zone files, capabilities, etc.). Useful when resources have different cost structures (such as different driver pay) or are based at different depots. False (0) Optimizer will not attempt to swap entire routes.
CalculateProfileCost	Determines whether ProfileCosts are automatically calculated on route changes. 1 Enables Setting 0 Disables Setting
InterRouteOptimizationInd	Enables inter optimizaiton (exchanging between routes). 1 Enables setting 0 Disables setting
InterRouteChainSize	Inter Chain Size limits the maximum number of stops that can be swapped between routes to find an improvement. Typical value is 3-7
IntraRouteOptimizationInd	Enables intra optimizaiton (exchanging within a route). 1 Enables setting 0 Disables setting
IntraRouteChainSize	Intra Chain Size limits the maximum number of stops that can be swapped within a route to find an improvement. Typical value is 3-7
MergeThreshold	Determines if Optimizer attempts to merge routes. True (1) Optimizer will attempt to merge two routes if the resulting route would have a total length less than MergeThreshold. False (0) Optimizer will not attempt to merge routes.
UseCandidateList	Determines if the Optimizer uses candidate lists, which can speed up the Assignment Process. True (1) Optimizer uses candidate lists. False (0) Optimizer does not use candidate lists. Candidate lists introduce an element of randomness into the

	Assignment Process. Re-running optimization on the same data set can yield different answers.
UseTimeWindows	Controls application of job and customer/depot time windows. 0 Apply any job time windows. Otherwise use customer/depot time windows. 1 Apply customer/depot time windows only. Ignore any job time windows. 2 Ignore all time windows. Only apply resource start and end times. UseTimeWindows default schedule setting The setting's name may be misleading. This is not a Boolean attributea value of 0 does not turn time windows off, and a value of 1 does not turn them on.
UseHardWindows	Determines handling of Window[X]LatestTime fields. 0 Job must be started by Window[X]LatestTime. 1 Job must be completed by Window[X]LatestTime. 2 Handling is determined by job's Window[1..12]Type attribute. If Window[X]Type is 0, the time window is arrival-based; if it is 1, the time window is completion-based.
UseRoadDistance	Determines if Router uses along-road distances or approximate distances when evaluating the schedule. See Distance Approximation Methods. 0 Use straight-line distances. 1 Use along-road distances.
UsePreferredResource	Determines treatment of jobs' PreferredRoute and RestrictPreferredRoute attributes. 0 Ignore jobs' PreferredRoute attributes. Overrides jobs' RestrictPreferredRoute attributes. Equivalent to selecting all jobs and setting RestrictPreferredRoute to false (0). 1 Use jobs' PreferredRoute attributes. Overrides jobs' RestrictPreferredRoute attributes. Equivalent to selecting all jobs and setting RestrictPreferredRoute to true (1). 2 Use PreferredRoute attributes on jobs that have RestrictPreferredRoute set to true (1).
PreferredResource	ResourceKey that order should be assigned to (Controlled by
PreferredResourceWarningInd	Determines if the PreferredRoute attribute in the Job Table triggers warnings or violations. True (1) A job assigned to a route other than its PreferredRoute value is served but triggers a warning. It is displayed in amber. False (0) A job assigned to a route other than its PreferredRoute value triggers a violation. It is not served, and is displayed in red.
UseRoutePosition	Determines treatment of tasks' RoutePosition attributes and jobs' Restrict[Type]RoutePosition attributes. 0 Ignore tasks' RoutePosition attributes. Overrides jobs' RestrictRoutePosition attributes. Equivalent to selecting all jobs and setting RestrictRoutePosition to false (0). 1 Use tasks' RoutePosition attributes. Overrides jobs' RestrictRoutePosition attributes. Equivalent to selecting all jobs and setting RestrictRoutePosition to true (1). 2 Use RoutePosition attributes on jobs that have RestrictRoutePosition set to true (1).
UseCluster	Turns clustering on and off. Clustering encourages the Optimizer to assign jobs that are near each other to the same route. Nearness is decided by a number of factors. Two jobs for the same client at the same location are usually near, as are two jobs for clients across the street from each other. Using clustering can speed up the Assignment Process. True (1) Optimizer attempts to keep jobs that are near to each other on the same route. False (0) Optimizer does not cluster nearby jobs. True (1) NoteClusters can be used only if there are no more than 65,535 jobs. Use AutoAssignCloseJobs to put all jobs for a single customer on the same route regardless of whether they will be served.
CountStops	Needs to be set to 1 if MaxStops is enabled.
DistanceAssessmentInd	Determines whether Router uses along-road distances or approximations. Should always be 0
Profit	Profit to be assigned to every assigned task.
ImprovementThreshold	During the Improvement Process, Optimizer will not consider any route change if the net profitability improvement is smaller than this number. Normal setting of

	approximately 0.1 allows Optimizer to find improvements that save miles while ignoring changes that save feet. Float Any floating point number (e.g., 0.0002, 1.0, 10.5) 0.1 Smaller numbers may mean longer run times.
MaxOptRunTime	Maximum time the optimizer should spend while performing an optimize all, selected routes or selected stops.
RtePosWithLockInd	When routes are locked indicates if the route position should be locked at the same time. 1 Enables Setting 0 Disables Setting
InfeasibilityTaggedConstraints	Soft constraints that can have an infeasible penalty applied. Represented by a 1 character letter C Capacity
InfeasiblePenalty	Penalty to be applied when an infeasible tagged constraint is violated.
SkipInitialLoadTime	Determines whether the time for pickups at the initial depot are calculated in the route. 1 Skips pickup time 0 Includes pickup time
RequirementsMatchBonusFactor	If the requirements match the resource the following BonusFactor is applied to the profit of the order.
MaxSuggestions	Maximum number of options to return on a suggest, smaller numbers may improve performance. Default is 0 (unlimited)
MaxSuggestPerRoute	Maximum number of suggestions to provide for a single route. Smaller numbers may improve performance but may also miss opportunities. Default is 0 (Unlimited)
AutoAssignCloseOrderInd	Determines if close jobs are automatically assigned to a single resource. True (1) When Optimizer assigns a job, it automatically assigns all jobs at that stop to the same resource. What constitutes a new stop is determined by the NewStop schedule setting. Can speed up Optimizer run time, but there can be a noticeable delay before Optimizer begins assigning jobs. False (0) Optimizer will assign one job at a time. If there are multiple jobs for the same customer, Optimizer will usually put all of these jobs on the same resource. Main difference from UseCluster is that AutoAssignCloseJobs will put all jobs for a single customer on the same route regardless of whether they will be served.
UnassignUnservicedOrdersInd	Determines if jobs that cannot be serviced are removed from routes. Boolean True (1) After optimization is complete, Optimizer will remove jobs that cannot be serviced, leaving such jobs unassigned. False (0) Optimizer will not remove jobs that cannot be serviced. A non-serviced job is highlighted in red and displays a violations. Allows you to judge if the Optimizer's estimates are accurate.
MinAssignmentProfit	Minimum incremental profit that a job must provide in order to be assigned. A value of zero (0) will usually, but not always, keep all unserved jobs from being assigned
SeedDesiredAreaInd	Enables improved handling for seeding with multiple depots. True (1) Prevents usable seeds from being assigned to the wrong area. False (0) Does not affect assignment. Especially useful in multi-depot settings where seed jobs might otherwise get assigned to a route with an inappropriate depot. Generally should be set to true (1) unless Assignment Process is producing bad answers.
SeedRouteInd	Determines if the Optimizer seeds routes. True (1) Optimizer seeds routes. False (0) Optimizer does not seed routes
SeedZonedOrdersInd	Determines if seeding is restricted to zoned jobs. True (1) Restricts seeding to zoned jobs. Un-zoned jobs are never used as seeds. False (0) Allows seeding with un-zoned jobs. Optimizer will never seed with more than one un-zoned job in a single pass. Should be set to true if all jobs are expected to be zoned. Should be set to false if there is a mix of zoned and un-zoned jobs.
UseTerritoryAssignment	Determines whether territories are assigned by Descartes Route Planner on Import and Save 1 Enables FW Territory Assignment 0 Disable FW Territory Assignment

TerritorySwapSetKey	User interface Territory Swap definition to use for routing (10.x) and advise calls (9.x).
ZoneFile	Path and Filename to store user interface zone files or read non-user interface zone files from
DynamicZoningInd	Dynamic zones require that all orders on a route must be within the dynamic zoning distance of the route/schedule. 1 Enables dynamic zoning 0 Disabled Dynamic zoning
DynamicZoningDistance	Maximum radius (units determined by DistanceUnits) that all jobs must be within if DynamicZoning is enabled. This can be overriden at the job level.
ServiceViolation	Tells rmpi how to handle the drive time and service duration of a stop in violation 0 = No distance or Service duration included in route 1 = Distance included but not service duration 2 = distance and service duration included in route Default1
SwapsToNeighborsInd	Limits InterRoute Optimization to swapping between routes that are in close proximity. Can improve Optimizer performance. True (1) Optimizer will only examine pairs of routes that are close together. False (0) Optimizer will examine all pairs of routes, subject to zone definitions. False (0) Should be set to true (1) if zones are not well-defined. May miss swap opportunities if capacities are included.
SwapsToNeighborsPointsInd	Limits InterRoute Optimization to swapping jobs that are in close proximity. Can improve Optimizer performance. Only used if RestrictSwapsToNeighbors is set to true (1). True (1) Optimizer will only examine pairs of jobs that are close together and on neighbouring routes. False (0) Optimizer will examine all pairs of jobs. May miss swap opportunities if capacities are included.
SwapsWithinZoneInd	Determines if Optimizer limits job swapping to within zones. True (1) Job swapping is limited to same zone only. False (0) Job swapping is controlled by the [Swaps] section of the zone file. See Swapping Jobs Between Zones.
ViableOrdersInd	Determines if jobs that violate rules are assigned. True (1) Jobs will not be assigned if they cannot be served by any resource. For example, a job will be excluded from assignment if (a) its time window cannot be met by any resource; (b) its volume is greater than the capacity of any resource; (c) no resource can drive directly from the pickup to the delivery and still meet the delivery time window; or (d) none of the resources have the capabilities required for the job. False (0) Optimizer will assign jobs even if they violate rules. You may want to assign such jobs if you do not completely trust the data, or if the constraints in the problem were not absolute.
ZonableOrdersInd	Controls assignment of jobs that have a zone which no resource can serve. See RestrictToZonableJobs Interaction. True (1) Jobs that have a zone that cannot be served by any resource will not be assigned. False (0) All jobs will be assigned, even in violation of zoning rules. If true (1), jobs with blank zones will not be assigned to any resource. If any resource has a wildcard zone (*), then every job can be served by that resource, so this setting is effectively ignored. If false, zones are still preserved as much as possible
MaxTimeWindowWait	Determines how long a resource will wait at a stop for a time window. This is an absolute value. The amount of time it will wait is managed by the Resource WaitTimePenalty. Given a setting of 3 hours, if a resource arrives at 09:00 AM and the time window opens at 12:00 PM, then the resource will wait. If the time window opens at 1:00 PM, then the resource will leave immediately, and the stop will not be served.
MaxAssignedBetweenIntra	When non-zero, during the Assignment Process Optimizer runs an IntraRoute Optimization pass every time the specified number of jobs is assigned to a route. For example, if setting is 10, IntraRoute Optimization runs after Optimizer has assigned 10 jobs, 20 jobs, 30 jobs, etc. If you have a tightly constrained problem, such as narrow time windows or capacity constraints, using this setting can help generate better assignment answers. Slows down Assignment Process. Defaults to 0

MaxUnservedOrders	Maximum number of unserved jobs that can be assigned. A value of -1 places no restriction on unserved jobs. This is an approximate setting. Under certain conditions generally related to cost structure the Optimizer can assign more unserved jobs.
NumberOfMeasures	Determines the maximum number of measures as defined in the database records that Descartes Route Planner will consider when determining capacity violations. Maximum value is 9. See Measure Attributes.
UseAutoPublish	If enabled autopublishing is enabled. When the autopublish API is called it compares the current route against the previously published route based on the App Config Settings. If it exceeds the limits the route will be published. 1 Enables Setting 0 Disables Setting
AccountName	Determines AccountName in published routes if Schedule publish settings are enabled.
ConnectionType	Determines publish method if Schedule publish settings are enabled. FTP Local Path HTTP
LocalPublishPath	Path to publish to if Connection Type is Local Path and Schedule Publish settings is enabled.
SenderID	SenderID to use if Schedule Publish settings is enabled.
ReceiverID	ReceiverID to use if Schedule Publish settings is enabled.
FTPURL	URL to publish to if Connection Type is FTP and Schedule Publish settings is enabled.
FTPUserName	Username to publish to if Connection Type is FTP and Schedule Publish settings is enabled.
FTPPassword	Password to use if Connection Type is FTP and Schedule Publish settings is enabled.
HttpURL	URL to publish to if Connection Type is HTTP and Schedule Publish settings is enabled.
DispatchMode	Needs to be Enabled for "Execution" type schedules. 1 Enables Setting 0 Disables Setting
StartRouteWGPS	Route will automatically be started upon first GPS messages. 1 Enables Setting 0 Disables Setting
UseAVLInd	Determins whether AVLParms are used. Should be 1 for Execution schedules. 1 Enables Setting 0 Disables Setting
ReschePartialCmplOrd	Determines whether "MISSED" orders are rescheduled. 1 Enables Setting 0 Disables Setting
ForceEndRouteInd	Determines whether end of route message is "forced". Any stops without a status will be marked as "MISSED". 1 Enables Setting 0 Disables Setting
UpdateDropoffQtyWActualPUQty	Determines wheter the planned Dropoff qty is updated to match the actual Pickup Qty 1 Enables Setting 0 Disables Setting
UseRmpiAdvise	Determines whether RMPI or ADAPI is used during advise calls. 1 Enables RMPI advise 0 Enables ADAPI advise (default and recommended)
SameStopSlots	Maximum number of stops to consider per slot during advise calls.
TurboAdvise	Determines whether turbo advise is utilized 1 Enables Setting 0 Disables Setting
TurboAdviseMaxRoutesPerDay	Maximum number of empty routes per day to consider when performing an advise call.
TurboAdviseStemDistance	Maximum distance from Depot to Job when determining resources to choose for advise call.
LowLevelReroute	Controls when low-level reroutes are performed. Router normally searches for routes that use no more than one continuous section of high-level roads (highways and connecting roads). When map data is sketchy, the best route will sometimes pass

	through more than one continuous high-level section, with low-level roads in between. To find such routes, a low-level reroute is required. Low-level reroutes are slow operations. Number 0 Never use low-level rerouting. Routes may be poor or not found in some cases, but routing will not be slowed down. 1 Use low-level rerouting when the normal routing fails to find a route. Provides reasonable performance in most cases. 2 Always use low-level routing. Routes will be optimal, but processing will be very slow. Default1 Only applied for Version 6 maps. See Map File Versions. Changing the setting causes any distance and duration cache data to be deleted. See Distance and Duration Cache File.
TelogisMapEditServer	URL for TelogisMapEditServer
Active Window	
Route Threshold	
Stop Threshold	
Distance Assessment	
AVL Status Refresh Cycle	
Mobility Window	
Min Avg Speed	
Min Temperature	
Max Temperature	
Automatic Enroute On GPS	
AutoCorrectGeocode Ind	Enables Geocode auto-correction. When a status message is received if the Distance between points and number of GPS points is acceptable the geocode of the location will be auto-corrected to the value provided with the status message. 1 Enables AVL Setting 0 Disables AVL Setting
AutoCorrectGeocode After	Number of "close" GPS points required to auto-correct the geocode of a location. Recommended value is 3.
AutoCorrectGeoDistance	Maximum Distance for GPS points to be considered close enough for geocode auto-correct of a location.
Speed Tolerance	
Service Duration Tolerance	
Depart Stop Tolerance	
Depart Distance Threshold	
Start Time Tolerance	

3.10 Cost Profile

Cost profiles are the rules used to calculate real world costs for the route in Descartes Route Planner.

CostProfileKey	Key Identifier for cost profile that is referenced by truck/driver/trailer
CostProfileDescription	Description of Cost Profile
StartupCost	Cost if the asset is utilized (regardless of duration)
Item#	Identifier for each cost rule, rules are applied in order.
CostDuration	Number of hours to which cost applies, if multiple durations are used they are applied in order.
LowerBoundHourOfDay	Minimum hour to which cost applies
UpperBoundHourOfDay	Maximum hour to which cost is applied
CostPerHour	Cost per hour
CostPerDistance	Cost per distance (based on unit)
LowerBoundDistance	Minimum distance to which cost applies
UpperBoundDistance	Maximum distance to which cost applies
DistanceUnits	Indicates if the distances are in mi or km

3.11 Product Type

Product types are products or activities that consumes the time or capacity of a truck as a component of an order line.

➲ Note— This is a predefined list that is specified by the order lines.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
ProductTypeKey	Predefined product (material) or service task. Orderline references this key.
ProductTypeName	Descriptive name for product.
Measure1 + (n)	Per Unit (Qty) Measure1
Measure1Factor	Per Unit (Qty) Measure1Factor
Measure2Factor	Per Unit (Qty) Measure2Factor
ServiceRate	Delivery Rate per Qty
PreServiceDuration	Per GeoStop service time per Qty
ServiceDuration	ServiceTime per Qty
PUPreServiceDuration	Pickup Per Qty PreService Time
PUServiceDuration	Pickup Per Qty PreService Time
DeliveryPreServiceDuration	Delivery Per Qty PreService Time
DeliveryServiceDuration	Delivery Per Qty Service Time
Profit	Per Qty Profit for orderline
Requirements	OrderLine Requirement
Commodities	Orderline commodity

3.12 Alert

A predefined list of custom alerts can be triggered by a driver action.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
AlertCodeKey	Key for the AlertCode, the wireless status message must match this key.
Description	Description of the AlertCode, not displayed on the dashboard.
AlertCodeValue	Value for the AlertCode, this value is displayed on the dashboard with the Key.
ColorCode	Black Blue Brown Cyan DarkBlue Gray Green LightGreen Orange Red Silver White Yellow
Type	1=Alert 2=Reason 3=System
Category	ALERT BREAK DELAY EVENT MISSED REVISIT SKIP BREAK SKIP Temperature Warning TEXT UNASSGNED UNPLANNEDSTOP

3.13 Territory

A territory is a geographical boundary that typically resides within a schedule. Orders and routes can belong to a territory; the optimizer will not route outside of the territory unless a zone swap is defined.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
TerritoryKey	Key for the territory, unique per schedule. This value is assigned to the order
Name	Descriptive name for the territory
Description	Description for the territory
ScheduleKey	Schedule that Territory exists in
ColorCode	Black Brown Cyan DarkBlue Green Orange Red Silver Yellow
Active	Marks the territory as Active if 1
DefaultInd	Indicates whether it is a default territory or not.
Latitude	Vertex Latitude, vertexes are loaded in sequence.
Longitude	Vertex Longitude, vertexes are loaded in sequence.

3.14 Truck

Defines the trucks assets that are available. Descartes Route Planner will check to make sure assets are not utilized on at the same time on two (or more) different routes.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
TruckKey	Key Identifier for Truck
InitialLocationID	Starting Depot for Truck, overrides depot assigned to resource/template
FinalLocationID	Ending Depot for Truck, overrides depot assigned to resource/template
LicenseIssueDate	Driver cannot be utilized past expiry date.
LicenseExpDate	Driver cannot be utilized past expiry date.
DriverID	Key of Linked Driver
TrailerID	Key of Linked Trailer
DummyInd	Dummy resource - not used in overlap checking, cannot synch to wGLN

3.15 Trailer

Defines the trailer assets that are available. Descartes Route Planner will check to make sure assets are not utilized on at the same time on two (or more) different routes.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
TrailerKey	Key Identifier for Trailer
InitialLocationID	Starting Depot for Truck, overrides depot assigned to resource/template
FinalLocationID	Ending Depot for Truck, overrides depot assigned to resource/template
LicenseIssueDate	Driver cannot be utilized past expiry date.
LicenseExpDate	Driver cannot be utilized past expiry date.
DummyInd	Dummy resource - not used in overlap checking, cannot synch to wGLN

3.16 Driver

Defines the driver assets that are available. Descartes Route Planner will check to make sure assets are not utilized on at the same time on two (or more) different routes.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
DriverKey	Key identifier for Driver
DriverName	Name of the driver
LocationID	Depot for Driver, overrides depot assigned to resource/template/truck
LicenseIssueDate	Driver cannot be utilized past expiry date.
LicenseExpDate	Driver cannot be utilized past expiry date.
DummyInd	If 1 indicates Dummy resource - not used in overlap checking, but cannot synch to wGLN

3.17 Route Templates

The route template defines the optimization or physical constraints of one of more trucks. However, typically, there is one template defined for each truck/driver.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
RouteTemplateKey	Unique vehicle identifier. E.g. Truck_D3_V1
ScheduleKey	
Name	Vehicle Description. E.g. Ford F160

RPProfileKey	Refers to the RtTempRoutingParms tab. Define a set of routing parameters as a profile that can be used with all routes or a subset of routes.
Start Location	Vehicle starting location. Must correspond to a Customer Number or Depot ID E.g. Depot01
End Location	Vehicle ending location. Must correspond to a Customer Number or Depot ID E.g. Depot01
Territory	Territory / Zone if used. Must have a customer with a corresponding Territory / Zone in order to work. E.g. TC4
Frequency	Frequency indicates which days a resource will be available. Include all valid letters e.g. MTS would represent Monday, Tuesday and Saturday U = Sunday M = Monday T = Tuesday W = Wednesday R = Thursday F = Friday S = Saturday
StartingTime	Not used in the DataMaker application directly. These fields can be used to create cell formulas to derive the application fields.
DriverHours	
Measure(n)	Vehicle capacity measure defined as Weight, Volume, Cases etc. Corresponds to Measure# capacity on your orders. E.g. 3500
PreServiceDuration	Service duration incurred prior to each order. Format hh:mm E.g. 00:10
PostServiceDuration	Service duration incurred after each order. Format hh:mm E.g. 00:15
MaxElapsedDuration	Maximum service duration from shift start to end in Format hh:mm E.g. 08:30
Requirements	Details any specific requirements a resource should be capable of meeting for orders. If used, ensure that there are orders with matching Requirements. Concatenate multiple requirements using a Space. E.g. SmallTruck
EarliestStartDay	Earliest day a vehicle departs Start Location in format #. The relative number of days from the chosen create date.
EarliestServiceDay	Earliest day a vehicle can service a customer in format #. The relative number of days from the chosen create date.
EarliestEndDay	Earliest day vehicle returns to End Location in format #. The relative number of days from the chosen create date.
LatestStartDay	Latest day vehicle departs Start Location in format #. The relative number of days from the chosen create date.
LatestServiceDay	Latest day vehicle can service a customer in format #. The relative number of days from the chosen create date.
LatestEndDay	Latest day vehicle returns to End Location in format #. The relative number of days from the chosen create date.
EarliestStartTime	Earliest time vehicle departs Start Location in format HH:mm
EarliestServiceTime	Earliest time vehicle can service a customer in format HH:mm
EarliestEndTime	Earliest time vehicle returns to End Location in format HH:mm
LatestStartTime	Latest time vehicle departs Start Location in format HH:mm
LatestServiceTime	Latest time vehicle can service a customer in format HH:mm
LatestEndTime	Latest time vehicle returns to End Location in format HH:mm
MaxStops	Max stops the vehicle can make on a route. E.g. 25
MaxDistance	Max distance the vehicle can travel on a route. E.g. 200
MaxDrivingTimeBeforeBreak	Maximum driving time before vehicle must take a break. Format hh:mm E.g. 04:30

MaxElapsedTimeBeforeBreak	Maximum elapsed time before vehicle must take a break. Format hh:mm E.g. 06:00
BreakDuration	Break duration Format hh:mm E.g. 0:45
MaxNumberOfBreaks	Maximum number of breaks that the vehicle can take. E.g. 2
MaxDrivingTimeBeforeRest	Maximum driving time before vehicle must take a rest. Format hh:mm E.g. 09:00
MaxElapsedTimeBeforeRest	Maximum elapsed time before vehicle must take a rest. Format hh:mm E.g. 12:00
RestDuration	Rest Duration Format hh:mm E.g. 12:00
BreakTimeOnDutyInd	Determines if time spent on break is counted as elapsed time between rests. E.g. 1 for Yes, 0 for No
DriverKey	A unique identifier which identifies the Driver / Mobile Device ID to be used for this route. E.g. 44001
SpeedFactor	Factor to adjust the travel speed of the resource. E.g. 0.95
ServiceSpeedFactor	Factor to adjust the service duration at the customer. E.g. 0.95
Description	General decription of the vehicle E.g. 1995 Ford F700
TractorKey	Vehicle identifier (Registration / Fleet number) E.G. WD075L
Work(n)Penalty	Penalty incurred per second when using the resource during the duration period up to Work1Duration. E.g. 0.001
Work(n)Duration	Duration period in which Work1Penalty is incurred for the resource. Duration is determined from Resource start. Format hh:mm E.g. 2:00
LastDateWorked	Last Date Driver worked. Used for DOT Hours of Service rules. E.g. 11/23/2006
WorkWeekLength	Length of the work Week in DOT rules. US is 7 or 8 days. E.g. 7
WorkWeekLimit	Maximum number of hours a driver may work in the WorkWeekLength. Format hh:mm E.g. 70:00
WeeklyRestLength	Specifies the rest required by the driver once the WorkWeekLimit has been reached by the driver. Format hh:mm E.g. 34:00
WorkWeekResetTime	Specifies the time of day that the work week resets / starts. Format hh:mm E.g. 06:00
WorkWeekHistory(n)	Number of hours worked by the driver on his last day worked. Format hh:mm E.g. 11:23
UDFxxxxxxxx(n)	User defined information for display in User Interface or to be sent to other applications. E.g. Collect cash

3.18 Route Template Routing Parameters

A grouping of routing parameters that provides the speed and costing structure that the optimizer uses for pathing decisions throughout the course of the day. This profile can then be assigned to route templates.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
ProfileKey	ResourceKey which must correspond to the ResourceKey on Resource Tab of this Workbook. E.g. Truck0001

RouteParmsKey	Routing Parameter Key - must exist in Fleetwise. When specifying 'DEFAULTS' as a value, it must be in all capital letters. E.g. RoadCost_Set10.
StartDate	Start Date and Time for the Routing parameter. Formatyyyy-MM-ddTHH:mm:ss Eg. 2006-01-15T14:00:00
EndDate	End Date and Time for the Routing parameter. Formatyyyy-MM-ddTHH:mm:ss Eg. 2006-01-15T14:00:00

3.19 Route Template Sets

A route template set is a group of route templates. Routes that are used on a daily basis and are grouped by facility.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
RouteTemplateKey	Route Template that is included in the set. This key must match the Route Template tab.
RouteTemplateSet Key	The key used for the set.
Name	Name for the set.
Description	Description for set.
Comment	Additional comments for the set.

3.20 Groups

Groups are used to specify what groups have access (read/write) to which schedules.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
Name	Descriptive name for the group.
ImpersonateOrgID	
Active	Marks the group as either active or disabled.
RightsProfile	Specifies what the group has access to view.
RoleProfile	Specifies what the group is able to do with the data the group has rights to. Role at the group level is the highest permission the user can have. Users can only have roles within their assigned groups.

3.21 Rights Profile

Rights profiles are used to specify a profile for groups. Rights are managed within Descartes Route Planner and determine what the user is able to "see".

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.

RightsProfileKey	Key for the rights profiles.
DocumentType	What the securable document is E.g. the Descartes Route Planner schedule.
AccessMethod	How access is managed to that document type.
Hierarchy	If hierarchy is chosen, then security is based on the hierarchy point and must be defined in Descartes Route Planner before you can load the specified group.
Hierarchy Path	Slash [/] delimited values that point to nodes in the hierarchy. E.g. One rights profile per terminal.

3.22 Role Profile

Role profiles are used to specify a profile for groups and users. Role profiles can be assigned to users and/or groups.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
RoleProfileKey	Key for the Role profile.
Role Name	The name of the role to include in the profile.

3.23 Users

Login credentials used to authenticate with Descartes Route Planner. Users must have both a group and roles assigned to authenticate. All communication with Descartes Route Planner requires a login. E.g. used in integration and user activities.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
LoginName	The username used during authentication.
Active	Marks the user as Active if 1
StartPage	The initial page that the user is taken to. For Descartes Route Planner this is the Dashboard.
FirstName	First name of the user.
LastName	Last name of the user.
Title	Title specified for user E.g. Dispatcher, Planner, etc.
PrefDateFmt	0=D-MMM-YYYY 1=DD/MM/YYYY 2=MM/DD/YYYY
DefTimeZone	
CurrencyCode	E.g. USD, CAD
EmailAddress	Email address for the user.
PrefLangCode	
PrefMeasSystem	1=US (Imperial) 2=Metric
AppPref	

3.24 Group Profile

What set of groups the user can have access to and what the default group is.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
GroupProfileKey	Key for the set of groups that can be assigned to a user.
UserGroup	Name of the group to include in the set.
Default Group	1 = Default Group, 0 = Not Default

3.25 Slice Nesting

Data slice nesting is used to specify what table data will be pulled from and how data will be filtered and returned to BGO. At least three values are required – Schedules, Routes and Stops, Time Windows.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
DataSetNestingKey	Key For Nesting used by DataSlice Values
TableName	Name of the table to use for the nestingFWSchedule FWResource FWRoute FWOrder FWStop FWActivity FWActivityWindow
Level1Attribute	Level1 attribute to be used in criteria statements in the DataSlice-Value
Level 2 +n Attribute	Level2 attrbitute to be used in criteria statements in the DataSlice-Value
Comment	
Company	

3.26 Slice Group

The data slice itself. Can be classified as BGO or DEDICATED_BGO.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
DataSetGroupKey	The key for the group.
AreaKey	The BGO pool that the group belongs to.
Type	Either BGO or DEDICATED_BGO.
Comment	

3.27 Slice Area

Slice area provides a mechanism for grouping slices together. A systematic way to create pools of BGO's and pools of Groups.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
AreaKey	The key for the BGO pool. Links data slices to BGO's.

3.28 Slice Value

Query parameters for the "Slice" and are used to return information to BGO. There are three main "queries" (Schedule, Stop and Route). The attributes refer to the "parameters" for the query and the sequence corresponds with the nesting, the "End Level" refers to how many attributes (in sequence) to use.

Row Type	The Type of Row of Data, only rows with an empty or "D" RowType will be processed, use ** to designate comments.
DataSetGroupKey	The slice / group that the query applies to.
DataSetNestingKey	The key used to derive the query structure.
EndLevel	Maximum number of attributes to use from the nesting, attributes are used in order. E.g. EndLevel=3 would use 1, 2 and 3.
Level1Operator	Operator used to compare level1value against the nesting level1 attribute
Level1Value	Value to compare against Nesting Level1 Attribute using the level1operator.
Level2Operator + (n)	Operator used to compare level2value against the nesting level2 attribute
Level2Value + (n)	Value to compare against Nesting Level2 Attribute using the level2 operator.
Comment	

4.0 Using DataMaker to Stage and Validate Data

DataMaker is used to translate the spreadsheet into a normalized format that Analyzer can use to generate application format XMLs. It also performs data validation to verify that the spreadsheet has required and complete data.

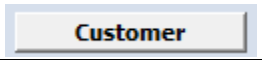
Requirements and assumptions of using the application:

- The user must have Microsoft Corporation's Access® installed on his or her machine, or a remote machine should it need be used via a remote session.
- Macros are used in the application; the user must accept the security warning, OR access the DataMaker.mdb via a secure folder as configured in the Access® Trust Center (see Appendix).

  Note— Both Excel® and Access® must be purchased separately from the Microsoft Corporation by the customer.

The DataMaker application is broken down into four sections. Once the aforementioned template workbook is completed, use the open dialog box to select your saved template.

4.1 Buttons

	View Table • Opens the associated table for viewing/editing.
	Clear Current Table • Removes all records from the associated table
	Load Current Table • Loads all records into the associated table from the Excel® template.
	Make Current Table • Loads all records into the associated table from the source tables.
	View Query • Opens the queries used to Make the current table for viewing/editing.
	Browse File • Allows browsing to select a file for import.
	Open Excel® File • Opens Excel® to the associated file.
	Table Count • Shows the current number of documents in the associated table.

4.2 Header

Application Version: The current version of the application is shown (e.g. v7.5)

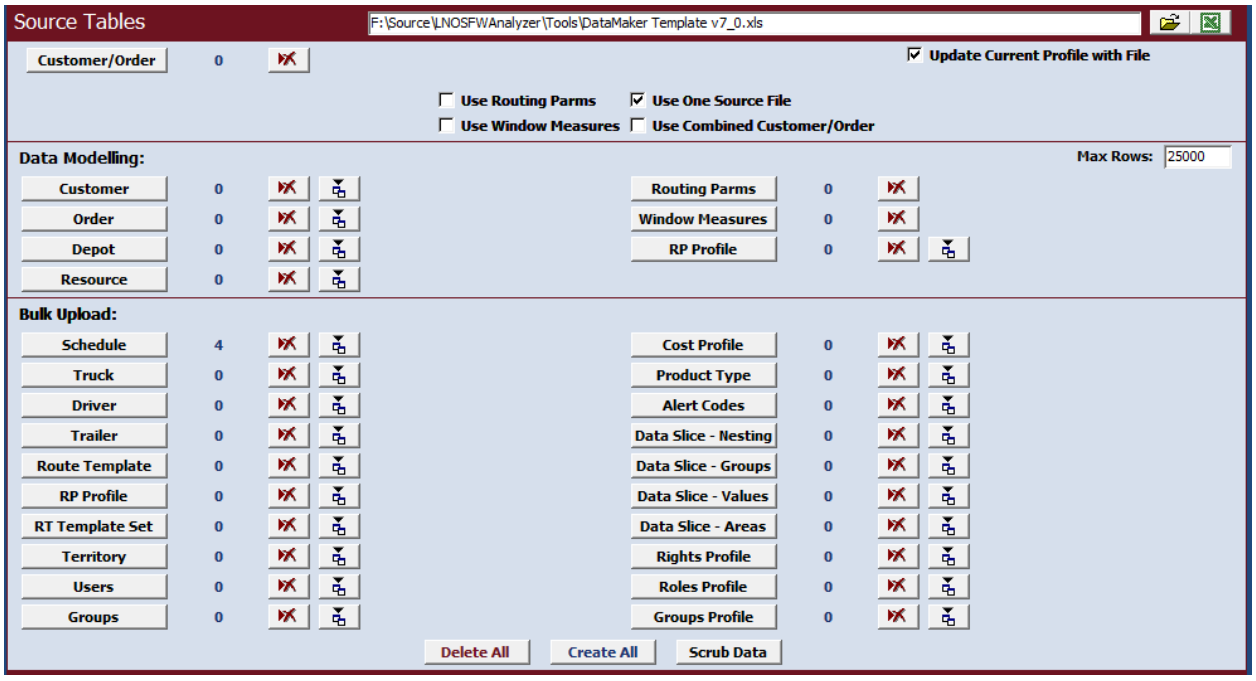
Version Log: Displays the version history of the DataMaker database and change log.

Profile: Allows editing of configuration Profiles

Profile Dropdown: Choosing a pre-configured profile to default configuration settings.

4.3 Source Tables

The source tables are used to stage the information from Excel® into the Access® Database before restructuring and assessing the information.



Source Table Options

Source File: Allows selection of a single source file for import.

Customer/Order:

- Default = **False**
- Shows the current count for the table and provides load/clear options if enabled.
- Enabled by choosing **Use Combined Customer/Order** checkbox.

Use Routing Parameters:

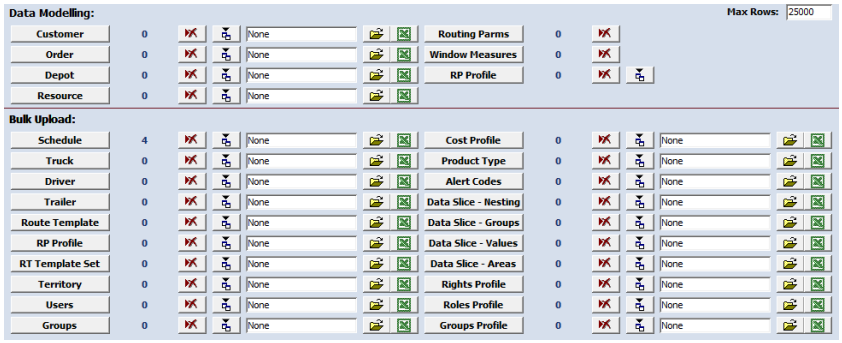
- Default = **False**
- Enables the "loading" of the **Routing Parms** table from Excel® file.

Use Window Measures:

- Default = **False**
- Enables the "loading" of the **Window Measures** table from Excel® file.

Use One Source File:

- Default = True
- If Unchecked allows a separate file to be specified for each table.



Use Combined Customer/Order: Uses the **CustomerOrder** tab instead of separate **Customer** and **Order** tabs.

Update Current Profile with File: The currently specified source file will be remembered (current profile is updated) when Access® is closed.

Data Modeling

The data modeling section is grouped to show the tables commonly using when performing modelling (or what-if) exercises. These are the basic tables required to be loaded. The primary tables are Customer, Order, Depot and Resource.

Customer: This table contains customer information.

Order: This table contains order/orderline information.

Depot: This table contains Depot/Terminal/DC information.

Resource: This table contains resource/route/trip information.

Routing Parameters: This table contains time of day routing parameters to use for each route.

Window Measures:

- This table contains the time windows for customers/orders.
- This table is only required when there are different measures per window or when there are multiple windows for a single order (nine to 11 and one to five). If a single window is utilized it is included in the order table.

Bulk Upload

The bulk upload section represents the items that will be loaded into Descartes Route Planner (once or multiple times) that are usually done through the user interface. This is provided as a means to manage or import a large number of entities through an Excel® spreadsheet rather than through the application user interface.

Schedule: This table contains the schedules and is loaded to **Data > Schedules**.

Truck: This table contains the truck assets and is loaded to **Data > Assets > Trucks**.

Driver: This table contains the driver assets and is loaded to **Data > Assets > Drivers**.

Trailer: This table contains the trailer assets and is loaded to **Data > Assets > Trailers**.

Route Template

- This table contains the route template details and is loaded to **Data > Templates > Route**.
- If the RouteTemplateSetKey is specified it will associate the Route Template Set with this Template.
- If the Routing Parameter Profile is specified will associated the routing parameters of the profile to the template.

RT Routing Parameters: This table contains the routing parameters associated with a specific template if specified in the separate tab (instead of using a profile in the route template tab).

RT Template Set: This table contains the list of route templates per set (instead of using the route template set field in the route template table).

Territory: The list of territories and vertexes to import geographic territories.

Users

- The list of users to be imported into Descartes Route Planner.
- New users are automatically setup with a password of "changeme".
- Existing user's passwords are not changed.
- The group profile field references which set of groups defined in the **Group Profile** tab to associate with this user.
- The Role Profile field references which set of roles defined in the **Role Profile** tab to associate with this user.

Groups

- The list of groups to be imported into Descartes Route Planner.
- Groups can have rights profiles and role profiles associated. These determine the maximum rights/roles that a user in the group can have.
- The Role Profile field references which set of roles defined in the **Role Profile** tab to associate with this group.
- The Rights Profile field references which set of roles defined in the **Rights Profile** tab to associate with this group.

Cost Profile

- The list of cost profiles to be loaded into Descartes Route Planner.

- Cost Profiles are used to calculated real-world costs for routes using the metrics determined by planned/actual metrics.

Product Type

- The list of product types to be loaded into Descartes Route Planner.
- Product types are used to have Descartes Route Planner "own" the metrics associated with a product so only quantities are required.

Alert Codes

- The list of custom alerts or reason codes to be loaded into Descartes Route Planner.
- Alert codes can be used to associate reasons or information to pass back to the dispatcher.

Data Slice – Nesting

- The list of BGO Nestings to be loaded into Descartes Route Planner.
- Nestings are used to define the criteria to use in a BGO data slice.

Data Slice – Groups

- The list of BGO Groups to be loaded into Descartes Route Planner.
- Groups represent a logical grouping of orders, routes and settings for BGO to use in optimization.
- Each group needs to be associated with an Area.

Data Slice – Values

- The list of BGO Values to be loaded into Descartes Route Planner.
- Values represent the criteria to use when selecting orders, routes and schedules for BGO to use in optimization. They are associated to the Groups and Nestings, both of which must already exist.

Data Slice – Areas

- The list of BGO Areas to be loaded into Descartes Route Planner.
- Areas represent a logical grouping of BGO groups and are used to manage the BGO pools.

Rights Profile

- The list of rights to be used when importing groups into Descartes Route Planner.
- The rights profile is a way to simplify the assignment of multiple rights to a group.

Roles Profile

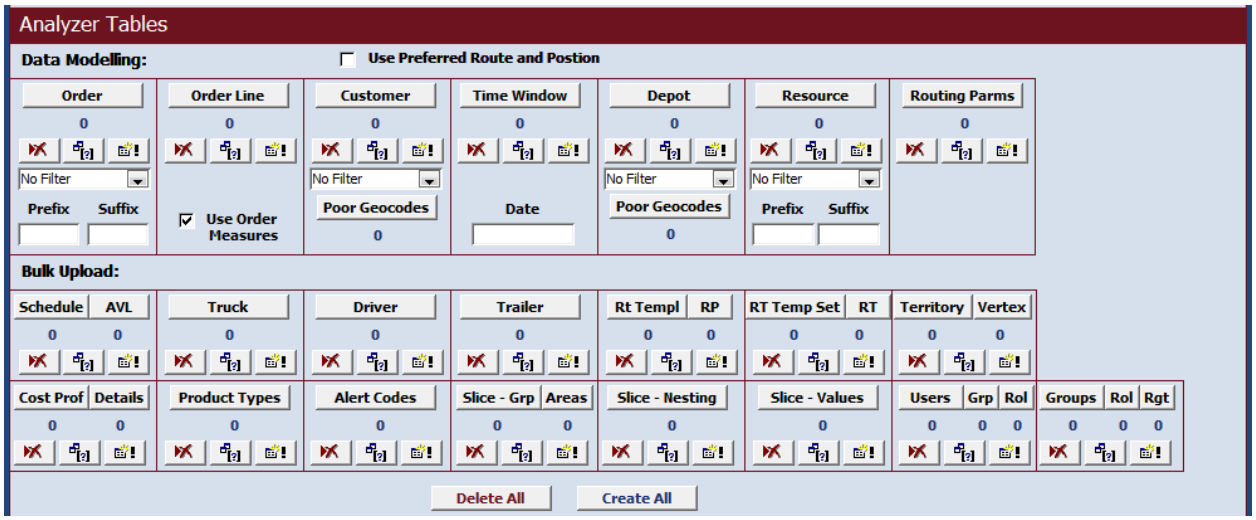
- The list of roles to be used when importing groups or users into Descartes Route Planner.
- The rights profile is a way to simplify the assignment of multiple roles to a group or user.

Groups Profile

- The list of groups to be used when importing users into Descartes Route Planner.
- The groups profile is a way to simplify the assignment of multiple groups to a group or user.
- Each group profile must have only one group set as default.

4.4 Analyzer Tables

The Analyzer tables are used to store the information from Excel® into a format that can be easily translated into the Descartes Route Planner XML format.



Use Preferred Route and Position:

- When loading the information, enables the preferredroute/position flags and sorts the data appropriately for loading.
- Should be enabled when loading a historical dataset.

Order: Constructed from the Order portion of the Order source table.

Order Line: Constructed from the Line portion of the Order source table.

Customer: Constructed from the Customer source table as-is.

Time Window: Constructed from the pickup/delivery times from the Order source table and the WindowMeasures source table.

Depot: Constructed from the Depot source table as-is.

Resource: Constructed from the Resource source table as-is.

Routing Parameters:

- Constructed from the Resource source table and routing parameter profile source tables.
- And constructed from the Routing Parameters source table as-is.

Schedule / AVL: Constructed from the Schedules source table, the AVL component is split out into a separate table for "Execution" type schedules.

Truck: Constructed from the Truck source table as-is.

Driver: Constructed from the Driver source table as-is.

Trailer: Constructed from the Trailer source table as-is.

RT Templ / RP: Constructed from the Route Template source table, the Routing parameters are created from the combination of Route Template and Routing Parameter Profiles source tables.

RT Temp Set / RT:

- Constructed from the Route Template source table using the Route Template Set Key.
- And; Constructed from the Route Template Set source table.

Territory / Vertex: Constructed from the Territory source table, vertexes are split into a separate table.

Cost Profiles / Details: Constructed from the Cost Profiles source table, details are split into a separate table.

Product Types: Constructed from the Product Types source table as-is.

Alert Codes: Constructed from the Alert Codes source table as-is.

Alice Area / Nesting / Group / Values: Constructed from the Slice source tables as-is.

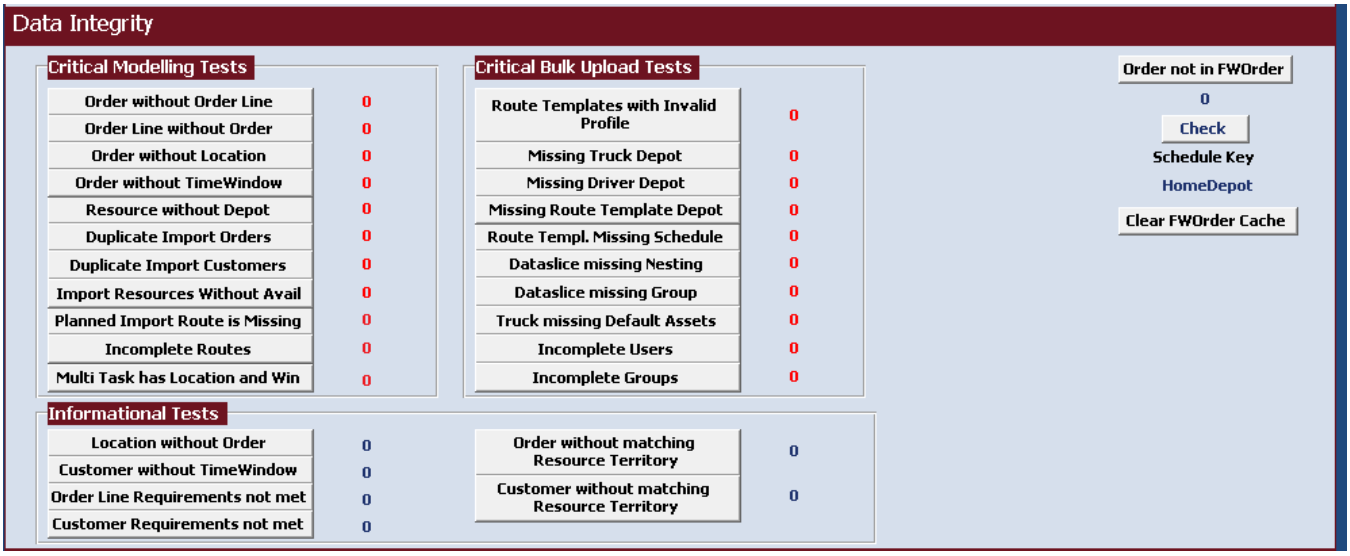
Users / Groups / Roles:

- Users are constructed from the User source tables as-is.
- User's Groups are constructed by joining the users and Group Profiles source tables.
- User's Roles are constructed by joining the users and Role Profiles source tables.

Groups / Roles / Rights:

- Groups are constructed from the Group source tables as-is.
- Group's Roles are constructed by joining the users and Role Profiles source tables.
- Group's Rights are constructed by joining the users and Rights Profiles source tables.

4.5 Data Integrity



Critical Modeling Tests:

- These tests are used to verify the integrity of the data to be loaded.
- All tests should show a count of 0.

Critical Bulk Upload Tests:

- These tests are used to verify the integrity of the data to be loaded.
- All tests should show a count of 0.

Informational Tests: These tests are used to verify the integrity of the data to be loaded, however they likely will not cause issues in Descartes Route Planner.

Order not in FWOrder: Displays all orders not currently in the Descartes Route Planner database defined in the profile. Looks only at orders in the referenced schedule key.

Check (button): Initiates the request to Descartes Route Planner database to compare.

Clear FWOrder Cache: Clears the cache from the previous request to the Descartes Route Planner database.

4.6 Utilities

The utilities are available to perform operations that are typically done when using the existing create all functions. these can be executed at any time to re-execute the task.

Sort Order by Planned Route and Route Position: Sorts the orders by route and position sequence in the Order Analyzer table.

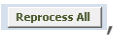
Show Planned Routes: Shows the orders in route sequence

Refresh UI: Refreshes all the counts on the form

Show Access System Messages

4.7 Workflow

The standard workflow when processing the spreadsheet through DataMaker is:

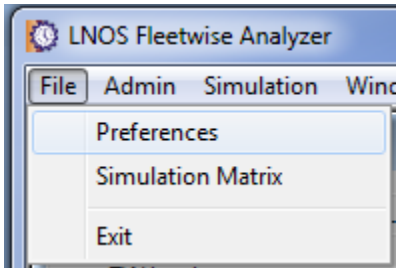
1. Select the Excel® file to import
2. In the Source table section:
   - **a** If records are showing click **Delete All** 
   - **b** Click **Import All** 
   - **c** Or; click **import** per *table* 
   - **d** Alternatively; **Click Reprocess All**  , in this case the Analyzer section can be skipped.
3. In the Analyzer table section:
   - **a** If records are showing click **Delete All** 
   - **b** Click **import** per *table*  set or click **Create All** 
4. In the Data Integrity section:
   - **a** If performing data modeling,
     - **i** Review the **Critical Modeling** tests
     - **ii** Click the button for each test to review the records that "failed".
     - **iii** Restart the process after resolving the issues or accepting the risk raised.
   - **b** If performing a bulk upload,
     - **i** Review the Critical Bulk Loading tests
     - **ii** Click the button for each test to review the records that "failed".
     - **iii** Restart the process after resolving the issues.

5.0 Using DataMaker and Analyzer

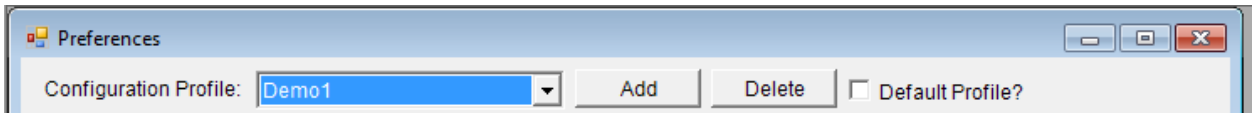
Analyzer is a tool responsible for translating and communicating the DataMaker configuration and data modeling information. It generates Descartes Route Planner XML's and posts them to the application reporting and logging failures.

5.1 Analyzer Preferences and Setup

Before using Analyzer it needs to be configured for the appropriate environment. This is done by going to **File > Preferences**. This configuration is saved to the registry and can be exported or imported onto a different computer and also to track multiple environments.

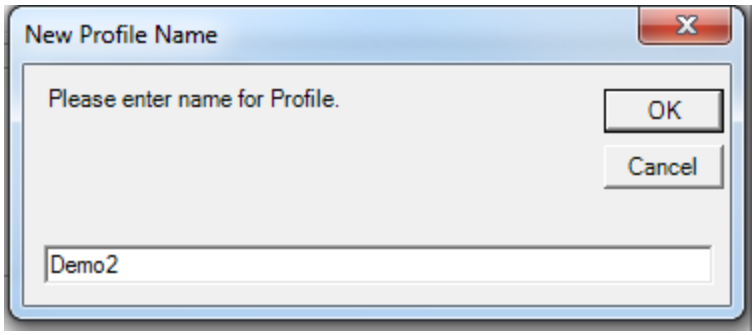


Profile Management



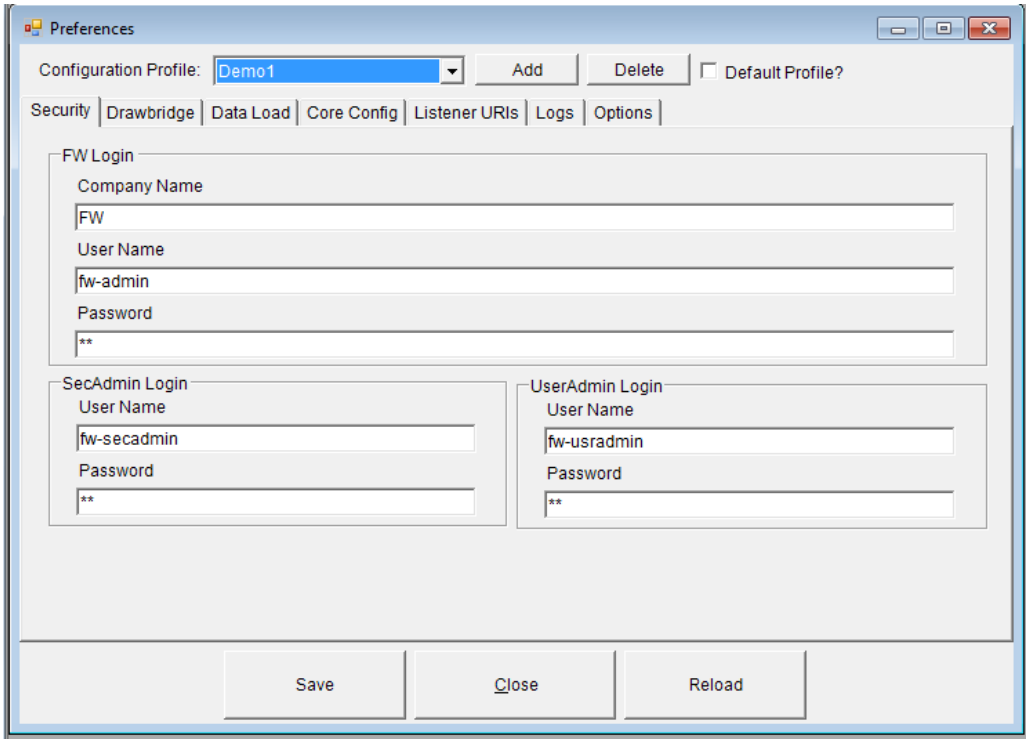
Analyzer supports configuration profiles to keep track of all the settings associated with an environment/customer.

- **Configuration Profile Drop Down:** A list of previous defined configuration profiles. Once selected the configuration form will be updated with the new settings. Clicking the **OK** button will activate the selected profile until Analyzer is restarted.
- **Add button:** Will create a new profile using the current profile as a template.



- **Delete button:** Will remove the currently selected profile. If the currently selected profile was the default profile, the first profile in the list will be made the default.
- **Default Profile?:** If checked, this profile will be loaded upon start of the Analyzer program.

Security Tab



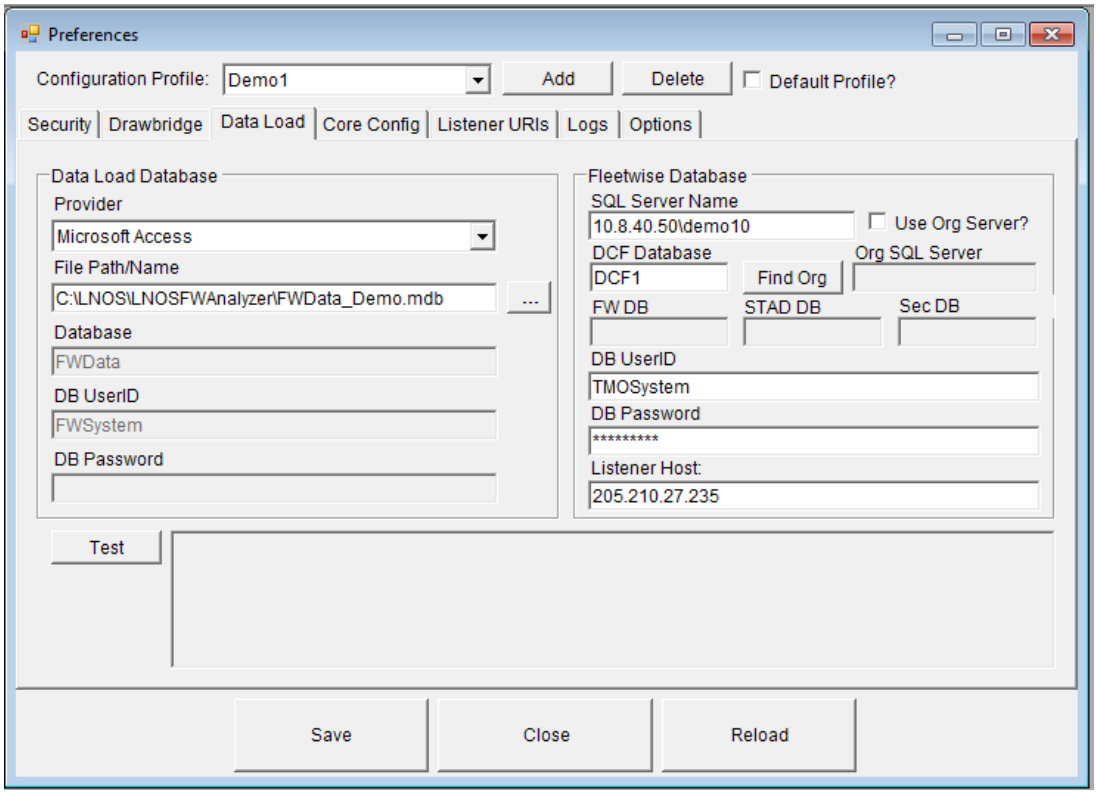
This tab allows users to specify the security credentials to use when communicating with Descartes Route Planner. The **Security** tab has the following sections:

- **FW Login:** Which Descartes Route Planner organization to communicate with and which credentials should be used to communicate the data modeling and bulk loading information.
- **Sec Admin Login:** Credentials used to communicate to Descartes Route Planner when working with user groups.
- **User Admin Login:** Credentials used to communicate to Descartes Route Planner when working with users.

Drawbridge Tab

This tab is no longer used.

Data Load Tab



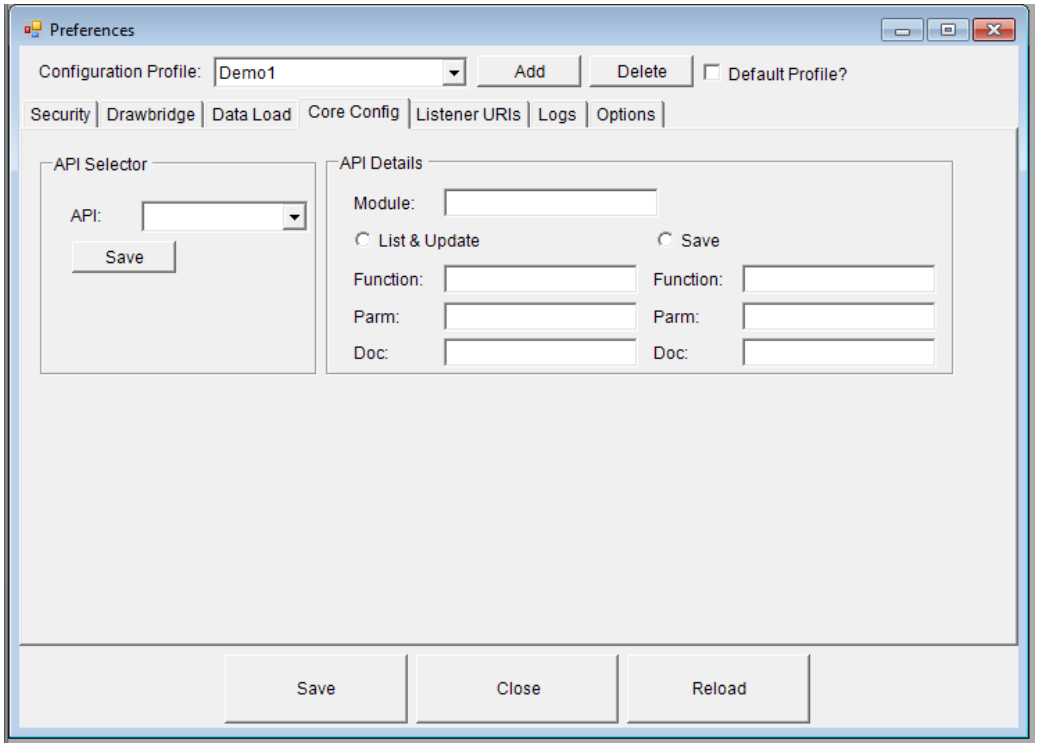
This tab contains the details of where to locate the information to be loaded (DataMaker) as well as the information to directly connect to the Descartes Route Planner database for any functions requiring access and to provide "count" statistics.

- **Provider**: Select your data maker source. (Should always be Microsoft® Access®)

- **File Path Name:** Specify the location and file name of the DataMaker database used in the previous sections.
- **SQL Server Name**: Specify the current SQL Server® that hosts the DCF (core) database and (typically) databases for the organization that data will be loaded to.
- **Use Org Server?:** If checked, will use the database name specified in the DCFHost table of the DCF database. Otherwise will use the provided SQL Server® Name, this is only required when the DCF and Org databases are on separate servers (not typical).
- **DCF Database:** specify the name of the DCF (core) database that contains the environment information. This is used to lookup the organization databases.
- **DB User Id:** SQL Server® account to connect to the Org/DCF databases.
- **DB Password:** Password for the Database User Id.
- **Listener Host:** the Application server hosting the various listeners.

➲ **Note—** SQL Server® must be purchased from the Microsoft Corporation by the customer.

Core Configuration Tab



This tab contains configuration options for internal commands, this is used to determine which API is used. This usually does not require any changes but may be required for older versions or newer versions where the function name is changed.

API Selector

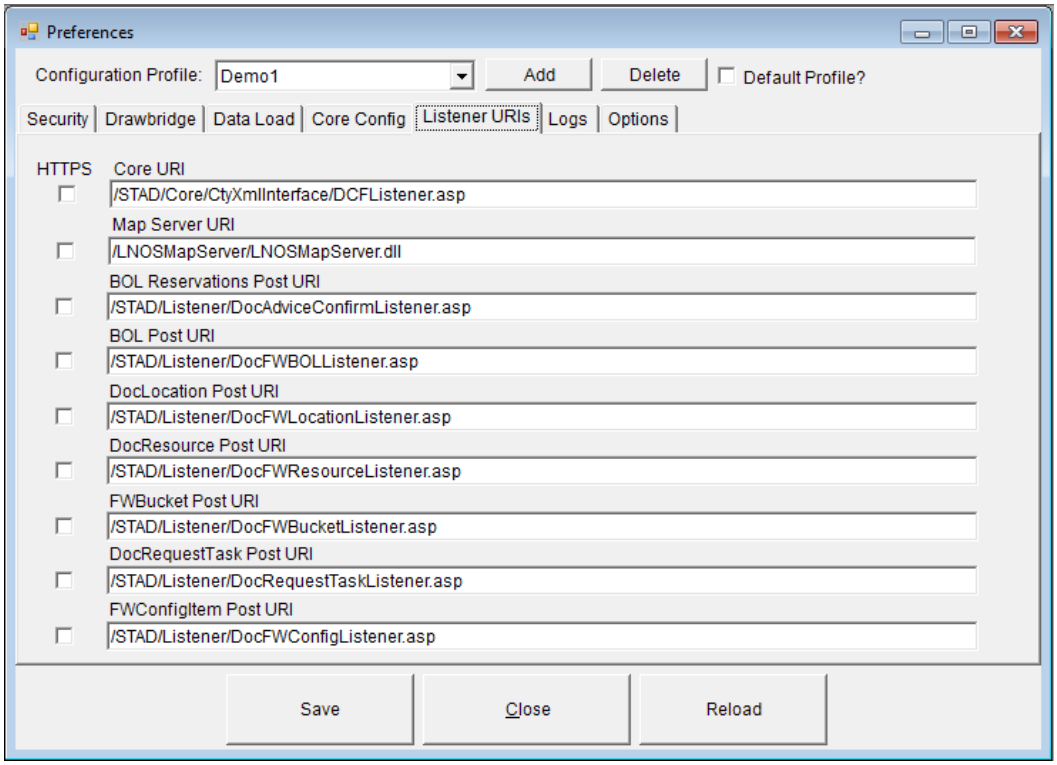
- Allows the modification of which internal API's are utilized to load bulk information, each piece to be loaded can use the List and Update method or the Save method.
- List and Update API's execute two commands: the first is a **List** to retrieve the IDs to update and then an update with the appropriate ID. If the List page size is not large enough, the IDs will not be included and the system may create a new (duplicate) record rather than update the existing record.
- Save API's do not require a list command. The API looks up the ID using the specified key.
- Clicking **Save** will modify the details of the API to be used.

API Details

Displays the current details of the currently selected API. The following API's use List and Update and require an appropriate List Page Size (see **Options** tab to configure this):

- Schedule
- AVL Parm
- Driver
- Truck
- Trailer
- Route Template
- Territory
- Time Zone
- Cost Profile
- Product Type
- Alert Code
- BGO – Area
- BGO – Nesting
- BGO – Group
- BGO – Value
- Route Template Set
- Groups
- Users

Listener URIs Tab

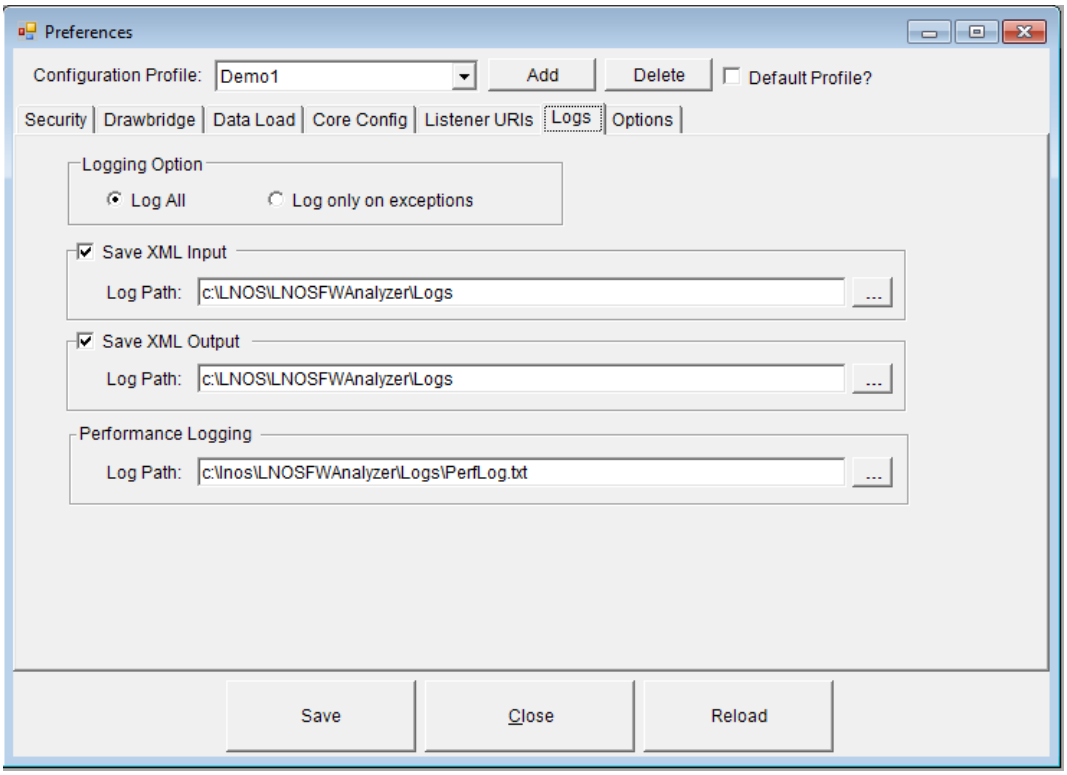


This tab contains the information used to communicate external (published) commands. Different Operations require different listeners. In previous versions, the host and URI were combined. Now, the host is provided on the data load tab and the URI is contained in this tab. The only configuration typically required is the HTTPS checkbox in environments that do not have an HTTP version of the listener.

- **HTTPS:** If checked, this listener will connect via HTTPS instead of HTTP e.g. https://ListenerHost/STAD/DocFWBOLListener.asp)
- **Core URI:** Listener used to communicate internal command XML calls.
- **BOL Reservation Post URI:** Listener used to communicate Advise/Confirm booking calls.
- **BOL Post URI:** Listener used to communicate Orders.
- **DocLocation Post URI:** Listener used to communicate depots, customers and perform geocoding.
- **DocResource Post URI:** Listener used to communicate resources (routes).
- **FWBucket Post URI:** Listener used to communicate buckets for the reservation process.
- **DocRequestTask Post URI:** Listener used to communicate activities to perform.

- **FWConfigItem Post URI:** Listener used to load several bulk items (e.g. trucks, drivers, trailers, etc).

Logs Tab



Used to configure logging. Each "load" activity perform will be logged into a separate log folder (using timestamp).

➲ **Note—** Selecting the logging option Log All will consume a large amount of disk space.

Logging Option

- Log All records all XML transactions
- Log Only Exceptions records only XML transactions that fail.
- It is recommended that this be set to Log Only Exceptions.

Save XML Input

- Specify log path for saving logged Input XML transactions
- It is suggested that this setting be checked.

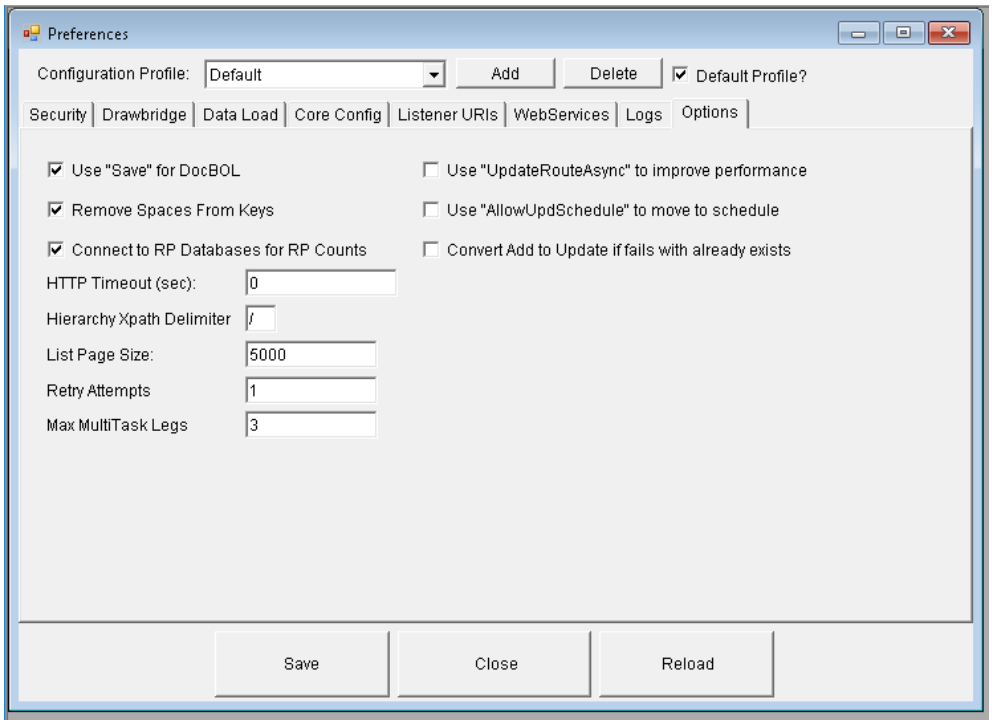
Save XML Output

- Specify log path for saving logged Response XML transactions

- It is suggested that this setting be checked.

Performance Logging: Specify log path and filename.

Options Tab



This tab is used configure general settings for the different load activities.

Use "Save" for DocBOL: When loading orders, the system will use the Save API instead of Add API. If an order already exists, it will be updated instead of failing.

Remove Spaces from Keys: When loading data, all spaces will be removed from the keys. Certain user interface functions may fail if a space is inappropriately used (e.g. Schedules).

Connect to Descartes Route Planner database for RP Counts

- When enabled, in the Load/Clear data screen, Analyzer will periodically query the Descartes Route Planner database for a count of the number of each entity (e.g. Order, Customer, Truck).
- By Default this is enabled, however for hosted customers or users that do not have access to the Descartes Route Planner database this feature should be turned off to avoid timeouts.
- If not disabled and the user does not have permission to access the SQL Server®, the Load/Clear screen will attempt to connect once. If this fails it will

disable the counts for this session. They can be re-enabled by click the **Enable Count Refresh** checkbox in the Clear Options section.

AllowUpdSchedule: If checked, will provided the attribute AllowUpdSchedule="true" in the DocBOL element. This will move the order from its current schedule to the schedule being loaded to. Disabled by default.

➲ **Note—** This setting could unintentionally cause problems if an order key is duplicated. Alternatively, **AllowUpdSchedule** could solve problems when data was loaded to the wrong schedule.

Use "UpdateRouteAsync" to improve performance: If checked will provide the attribute TaskName="UpdateRouteAsync" in the DocBOL element. This will let the batch processor do the assignment of stops to routes and any recalculation of the routes and will significantly reduce the time required to import data.

Use "AllowUpdSchedule" to move to schedule

- If checked, will provide the attribute AllowUpdSchedule="true" in the DocBOL element.
- Any orders imported that already exist will be moved to the schedule being loaded into. The default behavior is to update the orders without moving them.

Convert Add to Update if fails with already exists: In some APIs, there is no "save" API. In this scenario, if Analyzer detects an "add" failed with the error "already exists", it will automatically change the request to an update and retry. This counts towards the RetryAttempt count.

HTTP Timeout (sec): Maximum time to wait when posting a transaction. If a timeout occurs, the system will retry up to three times. Recommended value is less than or equal to 60 seconds.

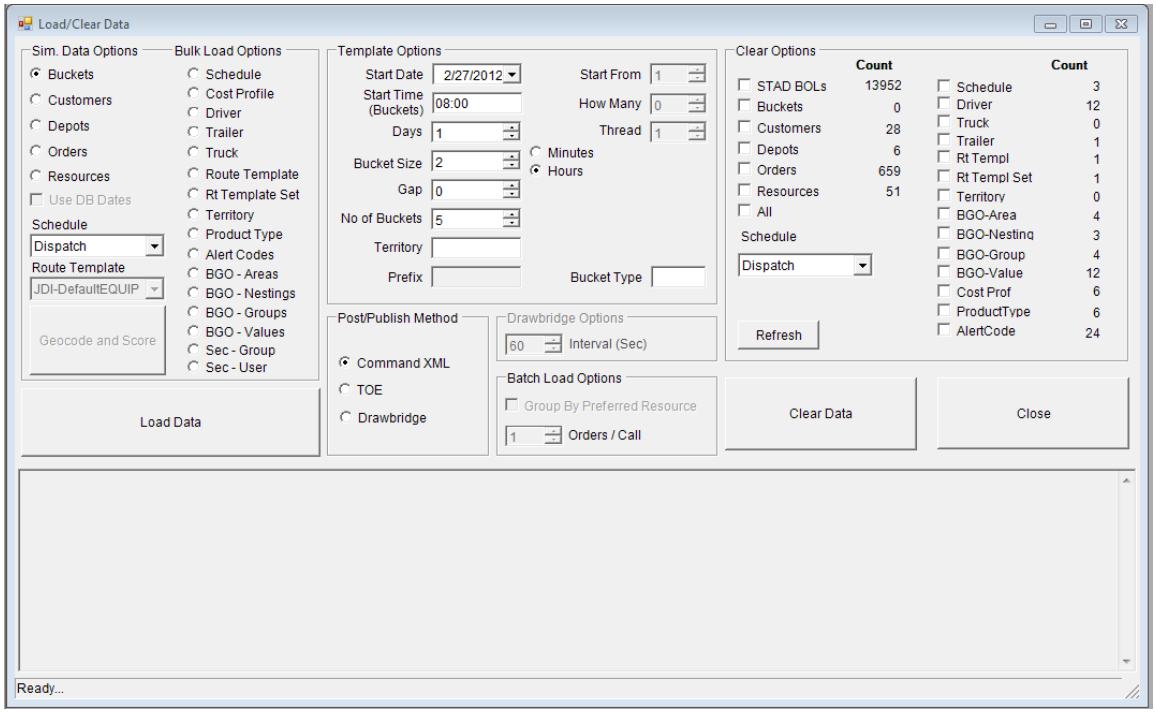
Hierarchy XPath Delimiter: Used to determine what delimiter will be used when reading hierarchy information for user group rights. If not specified it will default to "/". This is configurable to allow for hierarchy elements that contain the default character of "/" to avoid ambiguity.

List Page Size: Used to determine the maximum number of records to return with a list command, e.g. this should be larger than the total number of users ever to be loaded. The APIs using the List command can be seen by selecting them from the API Selector utility.

Max MultiTask Legs: When working with multi-task orders, determines the maximum number of distinct pickup/delivery legs Analyzer will look for in the DataMaker database. For example, when configured to "1", it will only look at Pickup Location; when configured to "2" it will also look for Pickup Location_2; when configured to "3" it will also look for Pickup Location_3.

➲ **Note—** Descartes Route Planner does not currently support more than 1 delivery location, although DataMaker and Analyzer supports this it will cause Descartes Route Planner to fail to on import.

5.2 Load/Clear Data



This screen is accessed via **Simulation > Load/Clear Data...** and is utilized to load data modeling or bulk information. Some APIs support multiple publishing methods and also allows multi-threaded loading and several other options when loading data.

Sim. Data Options

- Sim. Data Options Provides the means to select which data modeling data to load, each element must be loaded individually. The recommend sequence is:
  - Depot
  - Resources
  - Orders
- Customers are loaded with the orders if not loaded initially.

Use DB Dates

- When checked and loading orders/resources, it will use the dates specified in the DataMaker spreadsheet template.

- If Unchecked and loading orders/resources, it will use the date specified in the template options.

  ➲ **Note—** This should be defaulted in newer versions, older versions it is unchecked.

Schedule: The schedule to which the Buckets, Orders and Resources will be loaded.

Route Template: When loading resources, the selected template will be used for default cost settings if not overridden with the resource.

Geocode And Score

- This is only enabled when customers or depots is selected. The customers will be individually geocoded and the results will be updated in the DataMaker database.
- As of version 7.0 the DataMaker database will store the resolved address.
- Prior to version 7.0 only the score is stored.

Bulk Load Options: Which bulk load entity to load

Load Data: When clicked will load the selected Simulation data or Bulk Load data into Descartes Route Planner. The window below is used to provide a log of the load activities.

Template Options

- Only the appropriate options are displayed depending on the data to load.
- **Start Date:** Determines the date to be used when creating buckets or when "Use DB Dates" is not checked.
- **Start Time (Buckets):** When loading buckets what is the starting time to create buckets.
- **Days:** When creating buckets, how many days worth of buckets to be created starting on the Start Date
- **Bucket Size:** The size (duration) of each bucket starting at the Start time, e.g. if set to "2" and number of buckets is "5" it will create buckets for 8-10, 10-12, 12-2, 2-4, 4-6
- **Gap:** What the gap should be between buckets (in hours)
- **No of Buckets:** How many buckets to create per day
- **Territory:** What the territory of the bucket should be
- **Prefix:** When importing Simulation data all keys will be prefixed by this field. Typically used when using a DataMaker database as a template rather than historical dataset.
- **Start From:** When loading data, what is the first record to load (defaults to 1)
- **How Many:** When loading data, how many records should be loaded. (defaults to 0 which means all).
- **Thread:** When loading orders, how many threads should be used to load the data. This can be used to simulate load or to more quickly load data. This should not exceed the number of DCF$OPT services in the pool or server.

- **Bucket Type:** When loading buckets what type should they be designated as.

Post/Publish Method: When loading data should it use Command XML (internal) or TOE (published) API's. Each API will automatically select the "best" method automatically. This should only be changed if an error is encountered.

Clear Options

- The count beside each element shows the current number of records in the database or schedule for the element.
- The checkbox is used to select the element for clearing.
- **Schedule:** Which schedule to clear or perform counts in, should normally be configured to match the one being used to load information to.
- **Refresh:** Recounts all records, this is done automatically every 10 seconds.

Clear Data: Clears the data for the currently selected data elements (in the clear options section).

➲ **Note—** It is usually better to clear the schedule in the Descartes Route Planner user interface rather than through this option. This option performs the delete one document at a time and can be **very** slow.

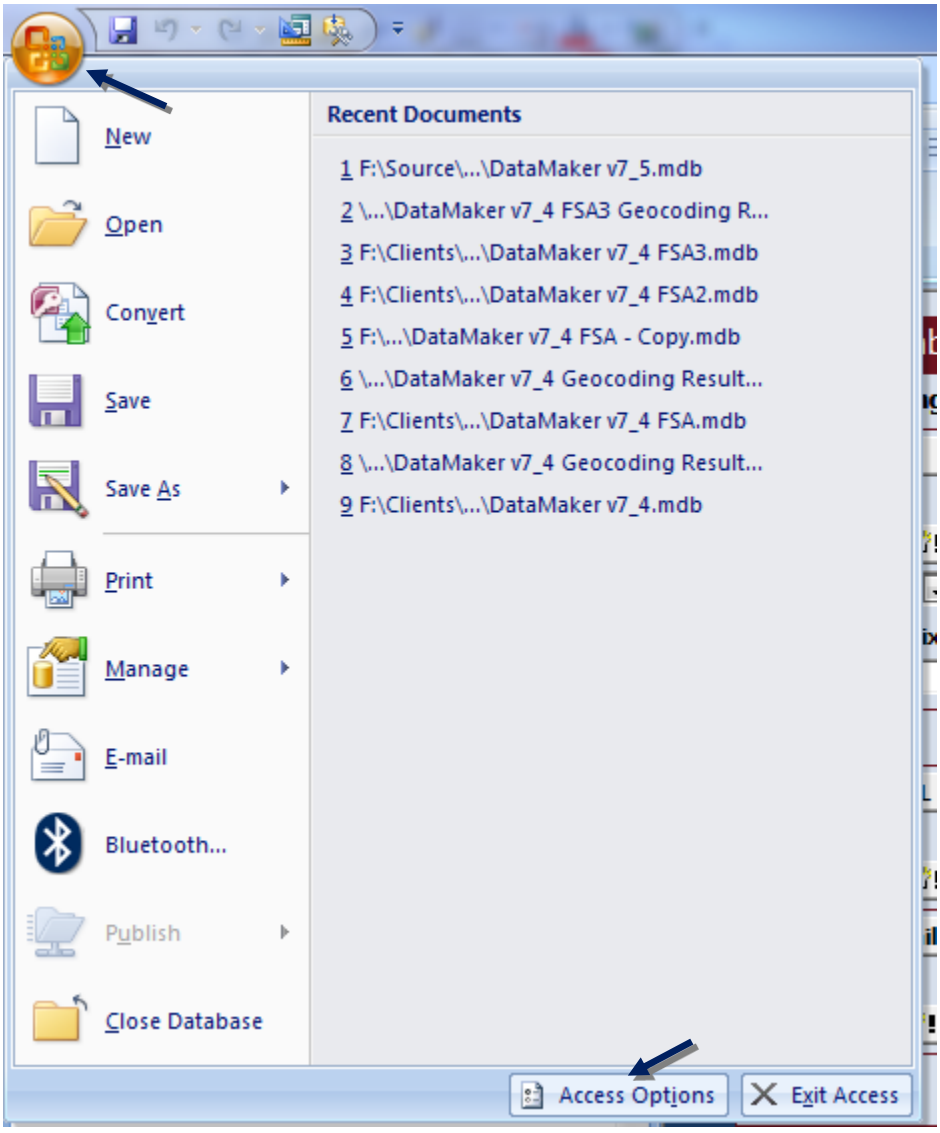
6.0 Appendix

6.1 Trust Center Configuration

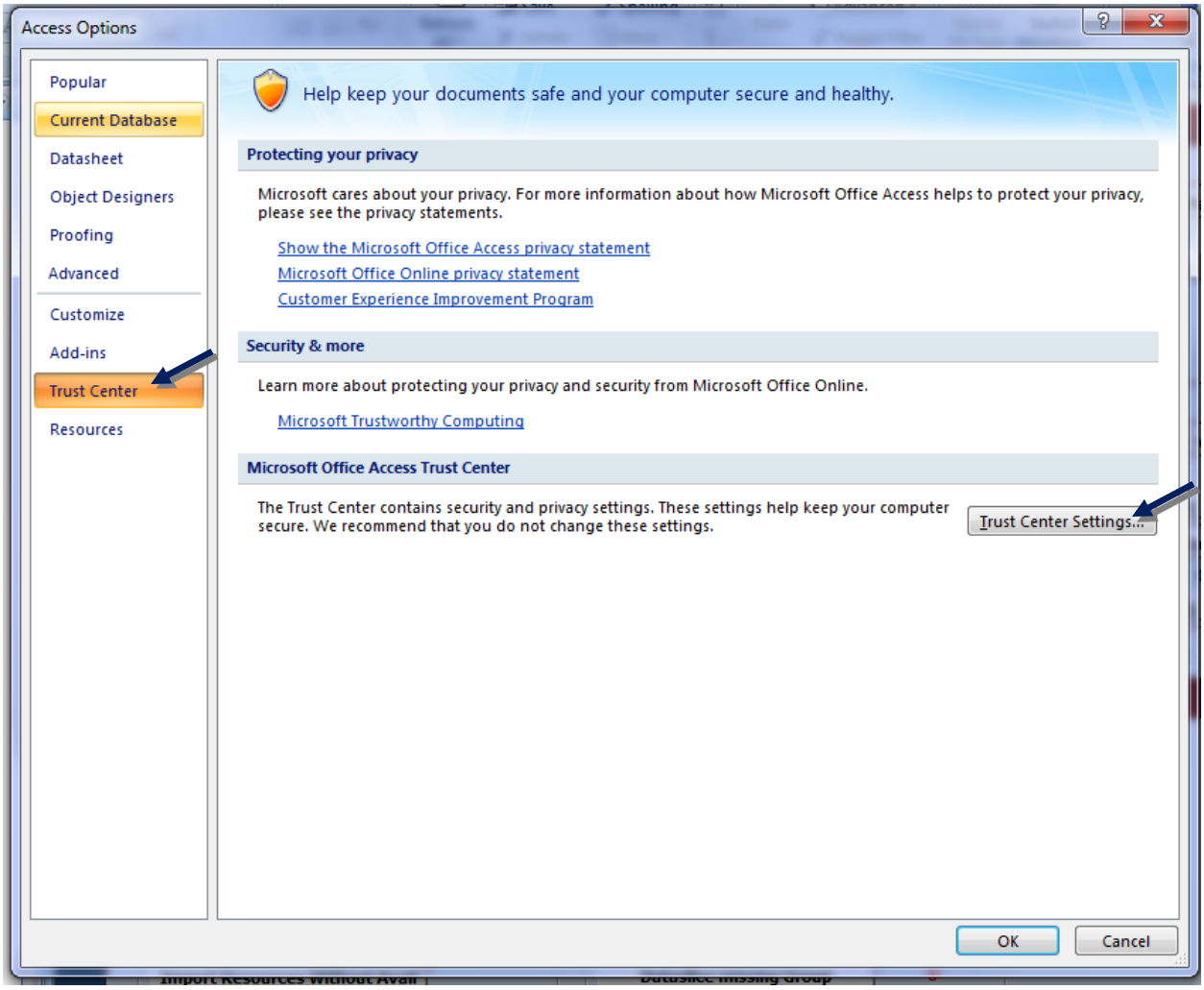
In order to eliminate the security prompt each time DataMaker is opened, the folder needs to be setup as a trusted location.

To set the folder as a trusted location:

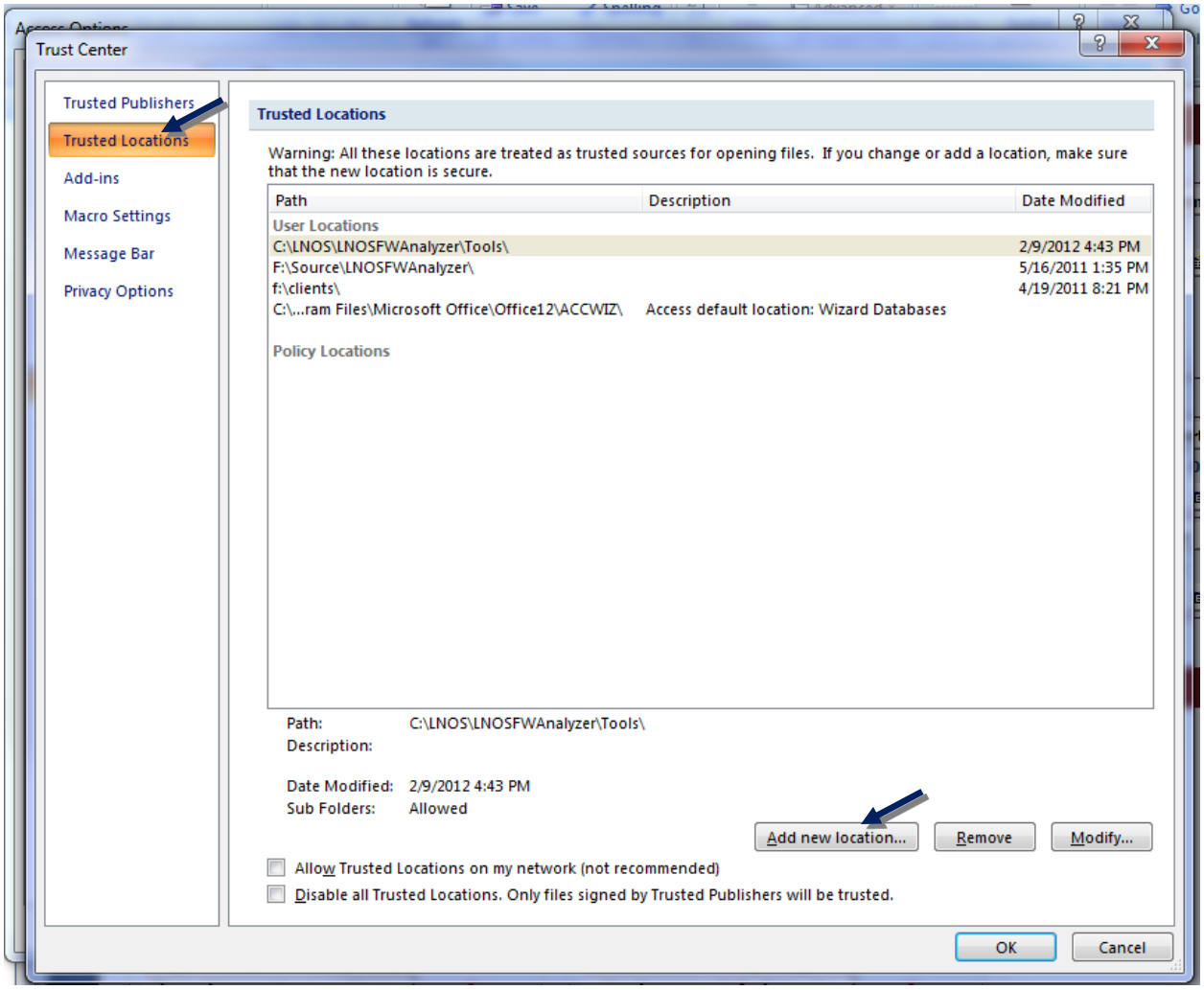
1 Select **Access Options** from the Microsoft Office® Menu.



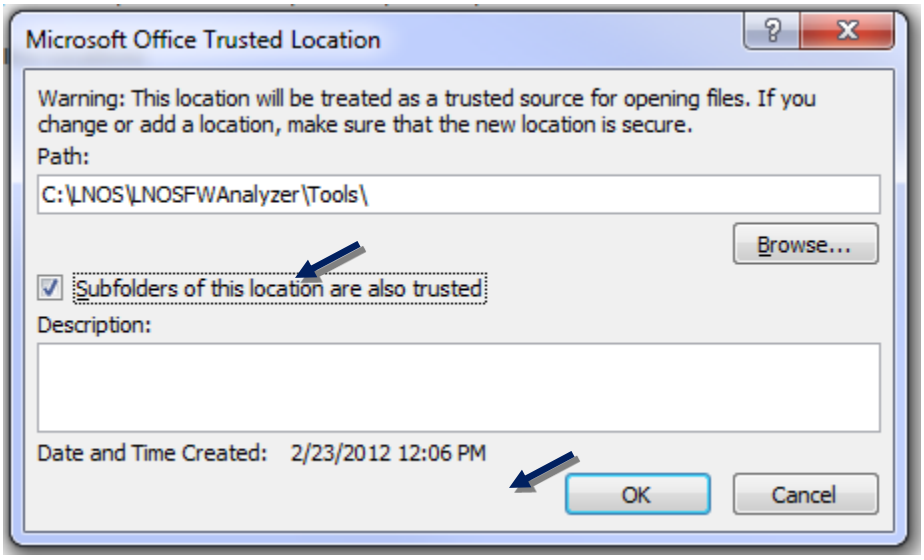
2 Navigate to **Trust Center > Trust Center Settings**.



3 Select **Trusted Locations > Add New Location**.



4 Configure the new path and click **OK**. It is normally recommended to enable the subfolders option.



6.2 DataMaker/Analyzer Sanitization

The Analyzer utility uses the following code/logic to sanitize data internally.

```
Private Function SanitizeDataForXML
            (ByVal sValue As String,
             Optional ByVal sSanitizeMode As String = "NORMAL"
            ) As String
        Dim sSanitizedValue As String
        sSanitizedValue = sValue
        If (sSanitizeMode.ToUpper() = "KEY") Then
            sSanitizedValue = Replace(sSanitizedValue, "&", "And")
            sSanitizedValue = Replace(sSanitizedValue, "<", "")
            sSanitizedValue = Replace(sSanitizedValue, ">", "")
            sSanitizedValue = Replace(sSanitizedValue, """", "")
            sSanitizedValue = Replace(sSanitizedValue, "'", "")
            sSanitizedValue = Replace(sSanitizedValue, ".", "")
            sSanitizedValue = Replace(sSanitizedValue, ",", "")
            sSanitizedValue = Replace(sSanitizedValue, "*", "")
            sSanitizedValue = Replace(sSanitizedValue, "|", "")
            sSanitizedValue = Replace(sSanitizedValue, "#", "")
        ElseIf (sSanitizeMode.ToUpper() = "GEOCODE") Then
            sSanitizedValue = Replace(sSanitizedValue, "&", " and ")
            sSanitizedValue = Replace(sSanitizedValue, "<", " ")
            sSanitizedValue = Replace(sSanitizedValue, ">", " ")
            sSanitizedValue = Replace(sSanitizedValue, """", " ")
            sSanitizedValue = Replace(sSanitizedValue, "'", " ")
            sSanitizedValue = Replace(sSanitizedValue, ".", " ")
            sSanitizedValue = Replace(sSanitizedValue, ",", " ")
```

```
            sSanitizedValue = Replace(sSanitizedValue, "*", " ")
            sSanitizedValue = Replace(sSanitizedValue, "|", " ")
            sSanitizedValue = Replace(sSanitizedValue, "#", " ")
        Else ' General sanitize
            sSanitizedValue = Replace(sSanitizedValue, "&", "&amp;")
            sSanitizedValue = Replace(sSanitizedValue, "<", "&lt;")
            sSanitizedValue = Replace(sSanitizedValue, ">", "&gt;")
            sSanitizedValue = Replace(sSanitizedValue, """", "&quot;")
            sSanitizedValue = Replace(sSanitizedValue, "'", "&apos;")
        End If
        ' Sanitize non-printable characters
        Dim i As Integer
        For i = 0 To 31
            sSanitizedValue = Replace(sSanitizedValue, Chr(i), " ")
        Next i
        Return sSanitizedValue
End Function
```