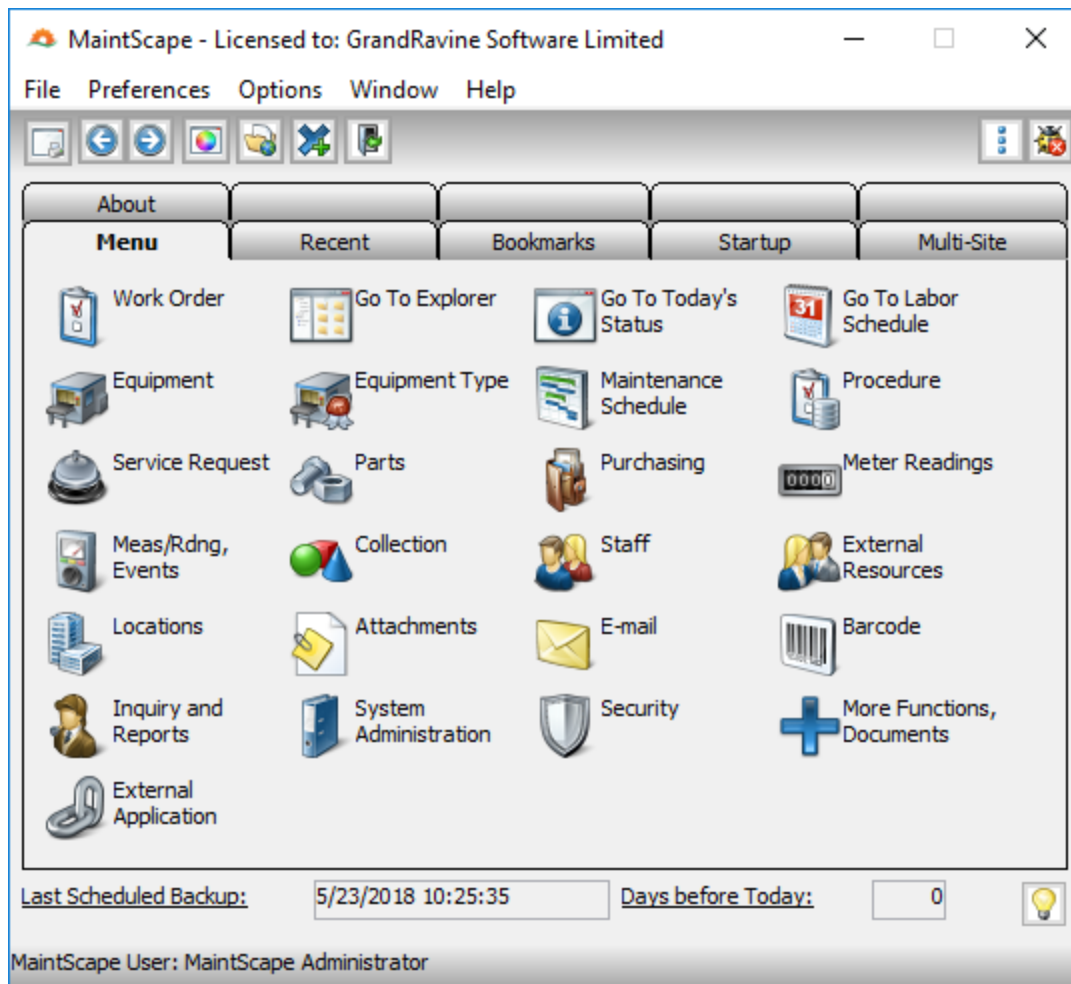


MaintScape™

CMMS and Calibration for Plants and Facilities



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Overview

Key Facts

- MaintScape is a general purpose Computerized Maintenance Management System (CMMS) for plant and facility maintenance, asset management and calibration.
- MaintScape has evolved and been continually enhanced ever since its first release in 1996.
- MaintScape is used by a very diverse range of businesses and organizations around the world.
- MaintScape's simple and consistent design makes it easy to use, flexible and powerful.
- The same MaintScape program can run either on a single workstation or as a client-server application across a network. Wide audience functionality is available through the MaintScapeWeb web application.
- MaintScape is an industrial strength computer system with data managed by a fully relational and transactional data base management system.

Our Customers Tell Us

- Because of its power, flexibility and consistency, their appreciation of MaintScape grows more and more over time.
- Our support is top notch - both in terms of response time and quality.
- MaintScape's functionality compares well with much more expensive CMMS programs. Some of these customers replaced more expensive CMMS programs with MaintScape.

Unique Strengths of MaintScape

- MaintScape is designed to let you work your way, not a "MaintScape way".
- MaintScape is extremely consistent. It is self-teaching once you know the very few key principles of operation.
- The following features are unique to MaintScape or unique in the way MaintScape implements them. These features are described further below.
 - MaintScape Explorer
 - MaintScape Collections
 - Today's Status
 - MaintScape drag-and-drop labor scheduler
 - Work Order Data Injector
- MaintScape is designed to have multiple windows active at a time, all cooperating with each other. Benefits include:
 - Increased productivity as you are switching between windows rather than constantly opening and closing windows. This savings is especially pronounced when you have a slow, remote network connection.

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- You can have multiple windows of any given type open at once. I.e. you do not have to stop working on one work order when you suddenly need to view or work on another.
- MaintScape flexibility and simplicity is leveraged by consistently using and interconnecting two major types of windows:
 - Powerful search windows for finding records and performing bulk actions.
 - Detail windows for viewing, editing and acting on individual records.
 - Very few windows are “modal” in that you cannot do anything else while they are open.

Pricing

- MaintScape is priced according to number of concurrent users, modules selected, and an optional equipment limit.
- The lowest entry price for MaintScape is \$1000.00 US for 100 equipment limit, single workstation operation and core functionality. The price for unlimited equipment, 4 concurrent networked users with parts inventory and purchasing optional modules is \$7395.00 US.
- A MaintScape license is a one-time purchase. Customers save considerably over the medium and long term compared to competitors with subscription pricing.

Please review the list of optional modules below, and contact GrandRavine Software for the price of a configuration which meets your needs.

Options for Evaluating MaintScape

GrandRavine Software can provide:

- More detailed documentation than this introductory overview.
- A web demonstration of MaintScape.
- A time-limited evaluation copy of MaintScape. Please bear in mind that using any computer system without training is challenging. Therefore, we recommend choosing this option only after the options above, and then using the MaintScape evaluation tutorial as a guide.
- MaintScape customer references.

MaintScape Core Functionality

The features listed below are not comprehensive. Please inquire if there is a feature not listed which you require.

Work Order

Work Order - 4132 - Boiler 1

File Edit View Shortcut Options Window Help

Task: 1 - Boiler 30

Meter Usage Parts Event History Notes Attachments User Fields

Main Main - 2 Task Description Explore Labor

Work Order

WO Number: 4132 Status: Scheduled (12/18/2017)

WO Type: Preventive Maintenance Target Date: 05/25/2018 Orig: 5/25/2018

Priority: Medium Planning Date: 05/25/2018 Pln Days: 0

Maintain: Equipment Site:

Equipment: Boiler 1 Boiler 1

Eqmt Cls: Boiler Equipment Type: Weil m34 - Weil-McLain Model 34

Location: 12 D2\B2\F1\R112

Account: Plant 100 Maintenance Dntm (hr) - proj: 0.00 - actl: 0.00

Tasks

Task Summary: Boiler 30 day Preventive Maintenance Task ID: 1 1 of 1

Sasmb1 Type:

Task Account: Next Due Date: 12/26/2017

from Proc: Boiler 30 day PM / Boiler 30 day Preventive Maintenance

Ready

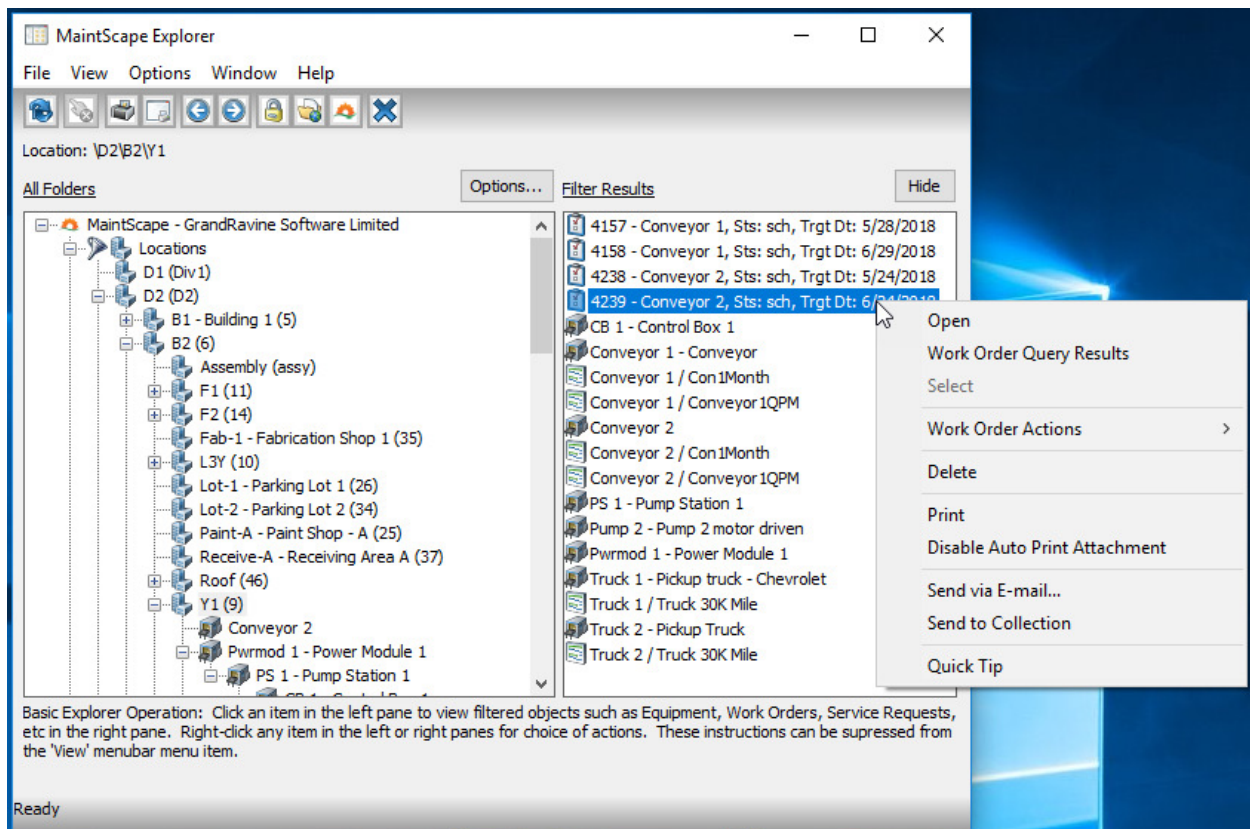
- Maintain equipment or locations.
- Customizable work order types and priorities.
- Created either manually or from a maintenance schedule. Manually created work orders can be quickly populated by importing one or more predefined procedures.
- Single or multiple tasks supported – each with their own unlimited parts and labor assignments.
- Status transitioning with history (including user and date) – e.g. scheduled to opened to closed.
- Cost accounts may be specified at the work order, task, labor, and part levels.
- Track how the work order was created, who requested it.
- Failure reason tracking.

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- Hierarchical summary view of work order tasks, parts and labor. Double-click on item in the hierarchy to navigation to its detail view.
- Labor may be unassigned or assigned to trade/skill, craftsman or contractor.
- Track scheduled and/or actual hours on multiple dates.
- Notifies when equipment is under warranty.
- View inventory levels of required parts (requires Inventory module).
- View attachments associated with work order's equipment, parts, etc. (requires professional version).
- Track cost of other equipment used in performing work.
- User defined fields (requires professional version).
- Bulk operations supported from the work order search window.

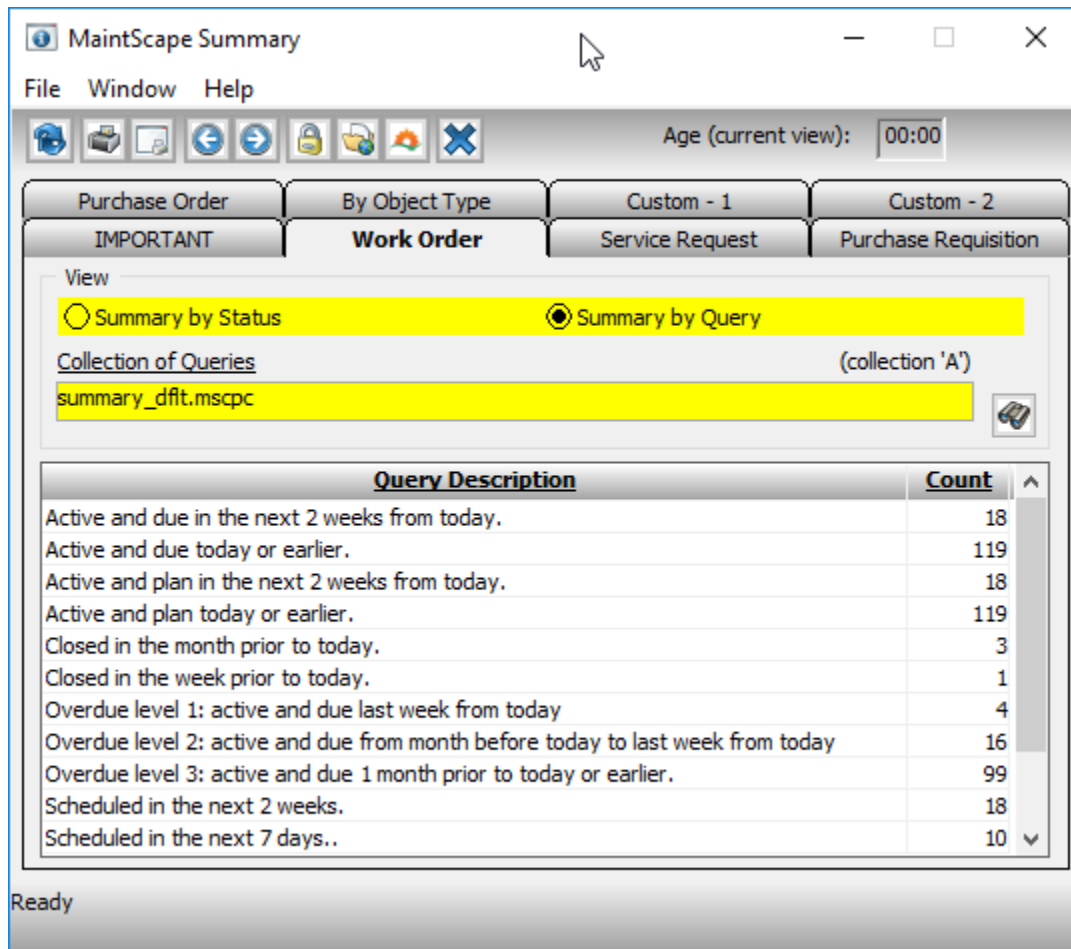
MaintScape Explorer

The pop-up context menu in the window image below was displayed by right-mouse clicking on the selected item. You can right-mouse click on items in the tree side of Explorer as well.



- Display and maintain a tree-structured representation of your facility.
- Perform actions on any item displayed in Explorer (for this reason, many customers use Explorer as the focus of their MaintScape work).
- No limit to the depth of parent/child relationships.
- Items displayed in the right-hand pane are completely configurable using “filters”.
- Change structure using drag and drop.

Today's Status



- Displays list of MaintScape statistics by category.
- List of statistics is completely configurable (each list item is a MaintScape query constructed using MaintScape search windows and stored in a MaintScape Collection).
- Double-click on any statistics line to see the list of records making up that statistic.

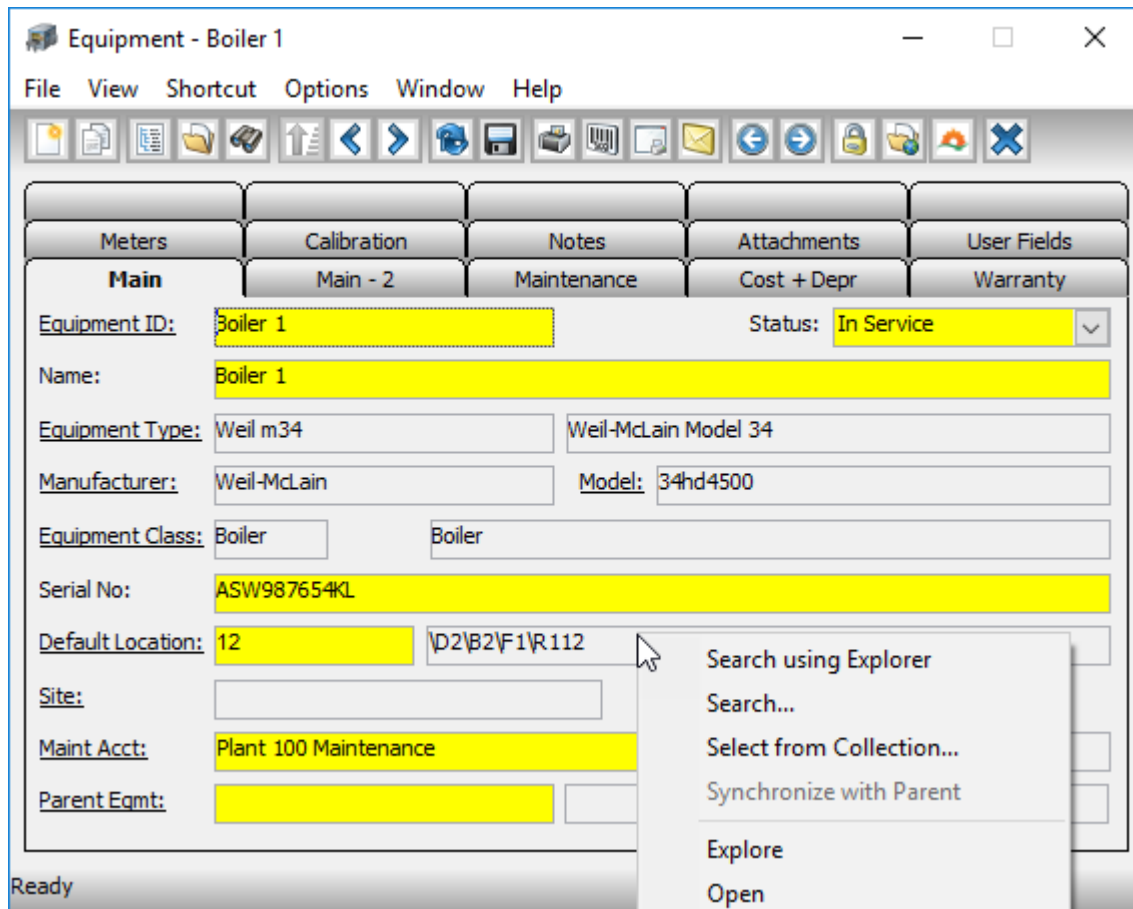
Maintenance Schedule, Procedures and Generating Work Orders

- Schedule by meter (e.g. running hours, miles) or calendar.
- Floating or non-floating maintenance schedules (floating schedules adjust due date of next work order based on closing date of the prior work order).
- Maintenance Schedules can be nested – E.g. Annual PM shadows Quarterly PM which in turn shadows Monthly PM.
- Generate work orders when measurements are outside tolerance (requires predictive maintenance module).
- Work orders are generated from Procedures (template work orders).
- Automatic suspension when equipment is out of service.
- Identify and analyze maintenance schedule problems.
- Seasonal block out.

Equipment

The pop-up context menu in the window image below was displayed by right-mouse clicking on the “Default Location” field.

This illustrates a **key operating principal** of MaintScape: you can right-mouse click on any field which has an underlined label to get a context menu of navigation and processing actions.



- Make-and-model information is maintained in one place (equipment type) and therefore does not need to be copied and synchronized for multiple equipment records.
- Parent/child relationships to an unlimited depth (can be viewed and maintained in MaintScape Explorer).
- Bill of material to an unlimited depth.
- Track manufacturer, vendor, cost and depreciation, warranty information.
- Specify unlimited number of craftsman and contractors for the equipment and the maintenance functions they perform. This data is used when assigning work order labor.
- Mark equipment as a calibration instrument and perform calibration forward/reverse tracing (calibration module required).
- Unlimited number of meters and measurement/reading points.
- Associate attachments (requires professional version).
- User fields (requires professional version).

Parts

Part - bearing 346 - bearing 346 - 1/2 inch sealed

File View Options Window Help

Last Used Price History Attachments Notes Substitutions User Fields

Main **Inventory** Vendors Order Units Explosion

Inventory and Purchasing Summary

- Planned: 6.00
 - = Available: 6.00
 - = On Hand: 6.00
 - Reserved: 0.00
 - Committed: 0.00
 - = Committed from Part Locations: 0.00
 - + Committed Unassigned: 0.00
 - + Active Order/Requisition: 0.00

Shortfall, Excess, Reorder

Shortfall	Excess
0.00	0.00
Reorder to Min	Reorder to Max
0.00	0.00

Inventory Locations

Part Location	On Hand	Available	Min	Max	Commit
SR2\A1\B1 (37)	6.00	6.00	2.00	6.00	

Ready

Parts inventory control and parts purchasing of is described in the optional modules summary. Core parts functionality includes:

- Multiple units of measure
- Multiple units of order with standard and custom conversion factors to unit of measure.
- Associate part with an unlimited number of storage locations.
- Track manufacturer and an unlimited number of vendors.
- Unlimited number of price/quantity levels for a vendor.
- Parts explosion to an unlimited depth.
- Price history audit trail (inventory control module required for automatic price adjustment).
- Substitutions.
- Associate attachments (requires professional version).
- User fields (requires professional version).

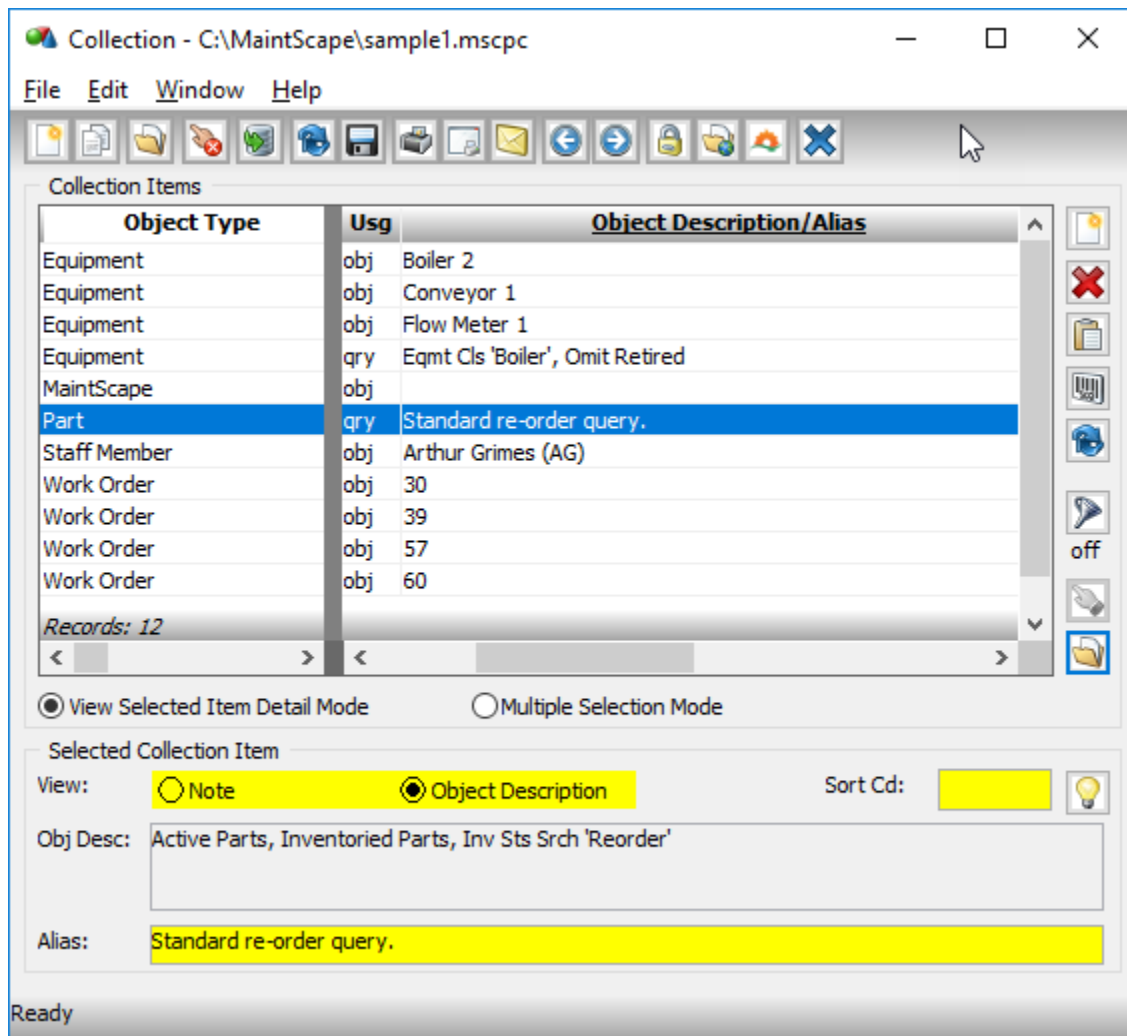
Work Order Data Injector

- Enables users to “inject” data such as labor or parts into work orders without having to navigate the full work order window.
- Permits users to add data to work orders while denying rights to modify data already on work orders. Ability to modify data already on work orders can be restricted to senior personnel.
- Security setting can restrict users to only enter their own labor.

MaintScape Collections

MaintScape Collections are files that list of one or more MaintScape objects (e.g. equipment 'Boiler 1', work order '1387') and/or one or more MaintScape queries (e.g. work orders due next week).

Collections can be created to have whatever meaning you like. Collections can be shared (e.g. by e-mail) and integrate with numerous MaintScape functions.



- Double-clicking a collection file outside MaintScape will open the collection in MaintScape, starting MaintScape if it is not already running.
- Double-clicking an item in a collection will open the item into the appropriate MaintScape window.
- You can copy or move items between collections using clipboard operations.
- Things you can do with MaintScape Collections:
 - Identify a set of work orders that a craftsman should do on a particular day (you can e-mail the collection file to the craftsman).
 - List frequently executed MaintScape queries. For example, "work orders more than one week overdue".

- You can drive MaintScape reports from the set of items stored in a collection. This is useful when the items you wish to report on are not easily returned by a standard query.

Staff and External Resources

- Staff records represent individuals who belong to your company or organization.
- Staff can be assigned multiple roles – e.g. craftsman, parts buyer, etc.
- Billing rates can be specified at the staff level or trade/skill level.
- MaintScape users are staff records that have been granted permission to log on to MaintScape.
- External Resource records represent outside individuals or companies.
- External resources can be assigned multiple roles – e.g. maintenance contractor, part vendor, etc.
- External resources may be related hierarchically – e.g. company to plant to contact.
- User defined fields (requires professional version).

Reporting

- Approximately 150 built-in reports.
- Reports results can be exported to external files (e.g. Microsoft Excel).
- Reports are driven from MaintScape search windows. Therefore, the same powerful queries used for online searching are used for driving reports.
- You can create custom reports against the MaintScape database using any major third-party reporting tool – e.g. Microsoft Access, Crystal Reports. The MaintScape database structure is fully documented to help you write such reports.

System Administration and Security

- Enable and configure automatic database backup schedule.
- Edit code tables.
- View connected users.
- Define MaintScape access privileges by security role. Security roles are then associated with the individual MaintScape users.

MaintScape Optional Modules

The features listed below are not comprehensive. Please inquire if there is a feature not listed which you require.

Professional Version

The Professional Version of MaintScape adds the following features:

- Attachments. Attachments are documents created using an external program such as Microsoft Word or Excel.
- E-mail integration.
- User defined fields.

Multi-Site

- Multiple sites can share the same database. Users can be configured to only view or maintain their site's data.

- Permission can be granted to users to view or maintain data at all sites. Viewing all data is useful for consolidated reporting.
- Data that is partitioned between sites include: equipment, work orders, locations, staff.
- Data that is shared between sites include: parts, code tables, procedures.

Parts Inventory Control

- Unlimited number of inventory locations.
- Inventory location hierarchy may be of arbitrary depth.
- Quantities tracked: on hand, committed, available, minimum, maximum, on order, requisitioned.
- Parts re-order inquiry accommodates quantities of parts already requisitioned or on order (requires parts purchasing module).
- All inventory changes implemented using permanent and auditable transactions. Transaction types are:
 - Count
 - Adjustment
 - Issue to work order
 - Direct issue
 - Receipt
 - Return to vendor
 - Transfer
- Inventory transactions are reversible.
- Automatic part price adjustment.

Parts Purchasing

- Purchase Requisitions and Purchase Orders supported.
- Purchase requisition items can be generated into purchase order items.
- Receive and return parts directly from the purchase requisition or purchase order (requires inventory control module).
- Life-cycle quantity reconciliation can be arbitrarily complex:
 - One PR item may generate into one or more PO items, potentially on multiple POs – e.g. replenish stock from multiple vendors.
 - One PO item can be generated from one or more PR items, potentially from multiple PRs – e.g. consolidate requisitions.
 - One PO or PR item may be received by one or more receipt transaction (requires inventory control module) – e.g. accommodate partial shipments.
 - One receipt transaction can be generated from one or more PO or PR items (requires inventory control module) – e.g. accommodate consolidated shipments.
- Cost accounts supported at the PO/PR level and item level.

Service Requests

- Three ways to create a Service Request:
 - Within a web page available on the company intranet.
 - Directly within a MaintScape window.
 - Process e-mail message received from requestor.
- Maintenance department approves or rejects service request.
- Non-maintenance personnel do not need to know equipment or location codes.

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- Status transitioning with history – e.g. pending approval to open to closed.
- One-click action to generate a work order.
- Mark duplicate service requests.

Drag and Drop Labor Scheduler

The screenshot shows the 'Labor Schedule' application window. The interface includes a menu bar (File, Options, Window, Help), a toolbar with various icons, and a 'Filters' section. The 'MaintScape Object' is set to 'Staff' (1 of 1), and the 'Query' is 'Role 'Craftsman', Active Staff'. The 'Dates From' is '05/21/2018' (Monday, May 21, 2018). The 'Assigned Labor' section displays a table with columns for days of the week (Mon 21 to Sun 27) and rows for staff members: Arthur Grimes, Betty Black, and Jacques Cousteau. The 'Unassigned Labor' section displays a table with columns for days of the week and rows for work orders: 4147 (Flow Meter 1) and 4214 (CB702). The status bar at the bottom indicates 'Ready'.

Lbr Type	Labor	Mon 21	Tue 22	Wed 23	Thu 24	Fri 25	Sat 26	Sun 27
stf	Arthur Grimes	00:00	00:00	00:00	00:00	00:00	00:00	00:00
stf	Betty Black	00:00	06:00	00:00	00:00	00:00	00:00	00:00
stf	Jacques Cousteau	00:00	06:00	00:00	07:30	00:00	00:00	00:00

WO No	Maintain	Mon 21	Tue 22	Wed 23	Thu 24	Fri 25	Sat 26	Sun 27
4147	Flow Meter 1	00:00	00:00	00:00	00:00	00:00	02:00	00:00
4214	CB702	00:00	06:00	00:00	00:00	00:00	00:00	00:00

- Drag and drop work hours from one craftsman or contractor to another craftsman or contractor.
- Drag and drop unassigned hours to a craftsman or contractor.
- Split hours on any drag and drop operation (e.g. 2 hours from one craftsman to 1 hour each for 2 other craftsmen).
- Drill-down to work orders represented by labor hours.
- Customizable color coding to indicate varying work loads.

Calibration

- Supported by special “calibration” work order type:
 - Create manually or from a maintenance schedule.
 - Record “as found” and “as left” conditions for “operable” and “in tolerance”. These values can expand or contract the calibration interval.
 - Record calibration instruments used and readings.
- Forward and reverse traceability of calibration instruments.
- Print calibration certificates.

Bar Coding

- Print bar code labels for equipment, parts or any MaintScape object type.
- Inventory counts.
- Issue parts to work orders.

Predictive Maintenance

- Import readings and maintenance events into MaintScape.
- Work orders are generated from readings and maintenance events based on configured rules – e.g. reading out of tolerance.

Text Renaming

- Rename terminology used within MaintScape – e.g. rename “craftsman” to “technician”.
- Modify MaintScape messages.
- Text renaming functionality is basis for translating MaintScape to other languages (Spanish presently supported).

Multiple Currency

- Order and receive parts in currencies other than the standard currency.
- Audit trail of currency conversion rates is maintained.

Technical Information

Hardware and Software Requirements

- MaintScape is not demanding in terms of resource requirements. Any modern computer is more than adequate for both the server and client.
- The MaintScape client is fully compatible with terminal server software such as Citrix.
- The MaintScape database server may be a VM (virtual machine).
- MaintScape ships with a fully relational and transactional database engine.

Miscellaneous Technical Information

- The MaintScape database is highly optimized to support a robust application. Key database statistics are:

Tables	244
Views	50
Foreign keys	602
Stored Procedures/Functions	431
Triggers	488

MaintScape database documentation reports can be printed from within the MaintScape application.

- Database integrity is enforced using key constraints, check constraints and fail-safe checks in trigger code.

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- Client/Server communication is minimized through client-side caching and reducing the need to re-retrieve data.
- The MaintScape user interface is designed according to object-oriented principles as published by IBM and Microsoft. Modal windows are kept to an absolute minimum.
- MaintScape is implemented as an object-oriented application where business functionality is isolated into business objects and consistently reused.