

D i g i t a l R e s o u r c e s , I n c .

For those interested in our Hollow Metal Configuration and Engineering Automation System:

In response to the many inquiries we have received requesting more detailed information about software tools, we have compiled a set of these questions and answers that we thought might be of general interest.

Please schedule an appointment with us as soon as convenient for you to discuss any additional questions you may have.

1. How complete is the system as it presently ships?

The following are among the major systems that are fully functioning and in the field. This is just a partial list of available powerful and dynamic capabilities:

- Component management: Parametric description of heads, jambs, mullions, sills, skins, channels, small parts, etc.
- Profile Management. Parametric description of families of profiles (double rabbet, single rabbet, double egress, cased opening, centered glass, etc.)
- Elevation management. Parametric description of how components join together to form an elevation assembly family. One family definition can be easily turned into an infinite number of variations for specific jobs. Configuration of arbitrarily complex elevations (assemblies) is supported.
- Hardware Item Management. Parametric description of hardware components. Includes support for multiple revisions of templates. Includes ability to represent multi-function hardware, such as mortise locks, as a single template drawing.
- Fabrication Management: Comprehensive description of manufacturing methods and resources. Supports multi-level techniques, such as brake-forming and roll-forming, or turret press processing and Laser processing. Completely automated programming of all programmable equipment, including turrets, Lasers, routers, brakes, right angle shears, etc.
- Relationship management: Parametric descriptions of how profiles affect components, of how hardware maps onto different components made out of different profiles, of how interconnecting components made from different profiles in the same elevation affect each other's construction, etc.
- Reference management: The parametric definition of location references and how they map onto different components as modified by different profiles and in the context of different elevations. For example, the location of "center of door" within a rabbet, or 'latch-tongue'. Supports simplified hardware locating.
- Location Standards Management – the parametric definition of hinge quantity and location and strike location standards for different manufacturers. The system can apply these standards when opening schedules are entered to automatically compute this data. Enhanced entry speed and accuracy result.
- Engineering Data Entry – the ability to define and process a single opening.

- Job Management – definition of jobs with user definable descriptive and sorting fields. Each job can have its own set of elevation and profile variants based on the global masters stored in the system.
- Opening Schedule Data Entry – The ability to enter a complete schedule of openings. The system supports any number of schedules for a job.
- Tag Management and status tracking – The entry and tracking of individual architectural tag or mark numbers. Each tag can be given individual coding for Door and Frame Release. In addition, each tag can be monitored for a variety of status. This includes engineering status (e.g.: waiting for jamb depth from contractor), manufacturing status (at the brake), etc.
- Specification Management – the description and application of a hierarchy of specifications. Specifications are a list of defaults or rules or relationships that can be applied to any element in the system. Typically, a specification will be established for the manufacturer or shop, for the customer, for the job, and for the individual opening schedule. This speeds data entry and improves accuracy.
- Hardware Set Management – definitions of items that comprise a hardware set to be used within a job. Fully parametric, dynamic and multi-level enabled.
- Door Opening (Window) Set Management – Doors may have any number of openings. Openings may be defined parametrically and dynamically. Example of parametric openings would be ones that adjust in size or location to the size of the door. Example of dynamic openings would be ones that automatically detect when they apply – such as a louver opening that only is active in doors of at least a certain height. Windows can have multi-level, dynamic, parametric bills attached. For example, purchased or fabricated window kits can be generated, as can moulding components.
- Detail, document, attachment, note management – drawings, sketches, scans, document files, parametric notes, etc. may be defined and associated with any level of item in the system, such as elevations, jobs, releases, etc.
- Icon management – an iconic image is a non-scaled graphical image used to represent an entity in the system. Icons may be used to represent profiles or elevations for example, where a fully scaled representation would be difficult to read. Even though icons are not scaled, they can be parametric. For example, the dimensions on an icon for a three sided frame elevation may show a height of 96" and a width of 36" even though the proportions are those of a conventional 7'-0" x 3'-0" frame.

Special Hinge and Strike location calculations – allows for automatic calculation of this data for frames as if the frame were a certain height even though it is actually to be manufactured to a different height.

- Grouping Management – definition of parameters of different levels of grouping – for example, what determines which doors can be listed on the same door assembly sheet or frames on the same frame assembly sheet. (For example, do frames that are identical except for different jamb depths go on the same Frame Assembly sheet). What parts can be grouped for punching or forming (for example, do you hand parts at the turret or the brake?)
- Release management – A job may have any number of releases. A release may reference any set of doors and or frames in a job (to come: releases across jobs).
- Remote Release Processing – a large release can take some time to process. We have created a system where the processing can occur on a remote application server controlled

from the releaser's computer. This computer works away on its own allowing the releaser to continue unimpeded with other work.

- Batch Processing – batches consist of multiple releases that are processed sequentially. Releases may come from different jobs.
- System wide language for defining rules, relationships, parametrics and dynamics. Same language and methods used across all modules and subsystems, simplifying training and operation. Language is implemented at the database level, so your personnel do not have to deal with the complexity of conventional computer code.
- Form Management and localization – most properties of most controls on forms and reports can be individualized for specific organizations and users. For example, the words used to describe different fields can be customized. Even the language can be customized. Controls that are of interest only for listers can be turned off for detailers and visa-versa.

Release document generation:

- Bill of material – comprehensive, multi level including all items such as small parts.
- Bill of methods – routings and supportive information such as required jigs.
- Assembly sheet/ travelers – conventional hollow metal grouped frame and door assembly sheets with all information and images arranged in one summary form for the assembly.
- Operation optimized reports – for shear, forming and punching that groups items in manner optimal for each operation, thereby minimizing set-ups and handling. Include detailed, dimensioned images to guide process.
- Shipping/Fire Label summary reports by architectural tag/mark numbers.
- Automatic generation of Numerical controlled programs for multiple turrets simultaneously

Architectural Door schedule submittal document generation:

- Door and frame schedule
- Frame section details
- Frame elevation details
- Door elevation details
- Sill section details
- Hardware schedule

Free Form Reports

- Powerful, easy to use, custom report generation.

Configurator, Estimating and Pricing

- Can interface with existing price books in a wide range of formats.
- Can replace price book estimating with estimates based on actual costs.
- Has full knowledge of every detail of product in computing costs and prices.
- Can access cost and other information stored in accounting and other management systems.
- Can return true margin to allow knowledge based negotiation.
- Can handle job and release based items – such as calculating how many palettes are required for different quantities of different sized frames and doors.
- Can add extras based on release quantities, such as an extra number of anchors, glue bottles, etc.
- Unlimited rules and complexity – prices can vary based on customer, general contractor, time of year, location, etc.
- Shipping, cost of money, storage, partial manufacturing (example – entire order is sheared and punched but only quantity for first release is formed), handled.
- Estimates can be submitted automatically to any level of detail to accounting system (for example, an order that is estimated based on full detail can be sent to accounting system as a single line item, such as Hollow Metal Product, or as a full bill of materials with individual values.
- Estimates can be entered to the inventory, shop management and other modules with different levels of details.
- Parametric routings can be computed along with parametric bill of materials.
- By handling all dynamic aspects of a configuration, Ordermation makes it possible to implement a fully effective ERP system using only static definitions – greatly simplifying and reducing the time, cost and complexity of configuring an ERP system.
- Reports can be generated in existing formats. For example, the system can automatically populate an existing estimating report spread sheet or word processing document.
- All information is retained when estimate is converted to order, so all that is needed is entry of additional information not entered at estimating time, if any.
- Customer versions of estimating system may be automatically individually generated and sent to customers electronically or on CD, or customer version of estimating system may be accessed on the Internet,
- Has “Expert System” engine that can be populated to catch and prevent errors. These include restrictions based on labeling or local ordinances, hardware inconsistencies, etc.
- Hierarchical specification system makes entry of estimates very quick and accurate.

In final testing and about to be released are the linkage to Axapta, Macola and Navision ERP systems

Modules geared for future release or that require some customization for each installation include "expert system" style verification of data entry, more complete exception reporting, central enterprise wide database, linking to other programs such as hardware set creation programs on the front end or additional ERP/MRP systems on the back-end, Internet based deployment of modules for access by remote staff and/or customers, and more.

DRI has positioned itself to be your support company over the long term for expertise in information management systems and hollow metal products/methods.

2. How long to be up and running, and on which phases?

This depends on a number of factors on both our company's side and your company's side. Both the order in which the phases are installed and the time required for us to configure, install, test and train the phases can vary. Typically, we think it can be most effective to start with the most detailed elements first and more towards the most general: 1. Component definition and generation of NC Code; 2. Elevation level definition and automatic generation of all components with hardware for elevation; 3. Job/Schedule level definition and processing of entire release; and 4: Submittal document generation. However, this order can be varied according to customer preferences and circumstances.

We have detailed milestone charts and schedules we can provide given different scenarios, and can commit to schedules based on our availability as well as the resources you can commit to the project and the pace you choose to proceed at. I would ask you to contact David Watson of our firm to discuss this in detail.

3. What operating system does it run on?

A current version MS Windows, typically XP Pro, is recommended. Other standard enabling software includes Autodesk Inventor Series and MS Office Professional, although variants are possible. We are authorized Autodesk developers and can supply this technology at a discount.

4. What are the hardware requirements?

Any computer capable of adequately running MS Windows XP and Microsoft Office XP Pro would be acceptable for the data entry type functions. These systems are available for well below \$1,000. The CAD level support functions surrounding new hardware items, new elevation family definitions, new NC tooling, etc. requires a computer capable of adequately running the above programs plus Autodesk Inventor Series. Such a system should have a fast processor, lots of RAM, high speed hard drive, and a good graphics processor with dedicated graphics memory. Such systems are available for well under \$2,000. Finally, the computer that is acting as the application server that processes releases should have all the capabilities of the CAD system, but perhaps an even faster processor and even more and faster RAM and a multi-disk RAID hard drive system. Such systems are available for well under \$3,000. We can help you with all configurations.

Due to the nature of hollow metal schedule forms, we recommend that even the pure data entry systems have wide format, high resolution displays.

We can also help you get a very good price on large format, duplexing, economical, color, Laser printers.

5. Have you ever integrated it with <various punches, Lasers, Plasmas, routers, folding machines, shears, etc. depending on customer>?

We would be happy to process a number of jobs through our system and send you code to run on your specific automated fabrication equipment to prove that our system will fully satisfy you in this area before any sales commitment is made. If interested, have the appropriate person in your organization contact us and we will arrange to get the information we need from him to run this test.

6. Are hardware cutouts fully and automatically integrated into the doors and the Frames?

100% fully and automatically integrated. Unlimited number and complexity.

7. What Frames components can receive automatic hardware cutouts, ie: Jambs, Mullions, Heads, Transoms?

ALL frame components can receive automatic hardware cutouts due to our powerful relationship and reference management subsystems described above.

8. Can the system be applied to other products

Yes. The system has been designed as a general purpose configuration and engineering automation tool for a wide range of mass customized products.

Please feel free to call me to discuss these or other issues at your convenience.

David Reed
President

Digital Resources, Inc.