IOCS update... 30th Anniversary
MICA (P) 097/04/2008 www.iocsasia.com Issue 30

From: Dave's Desk

Professional Engineering Solutions ~ 30 years on.....

IOCS is 30 Years Young in 2008.

Our industry provides computer-based solutions that allow engineers to work smarter and more productively than ever before. Designs are made in virtual space; analyses can help predict the outcome of a multitude of scenarios so the "best" can be picked. All this is possible before metal is cut or the die is cast.

But what of the engineer? Does relief from number-crunching make the job less demanding? Does smart software give the smart answer without the engineer thinking? Alas, no, my view is that it makes it more demanding. The old adage "garbage-in garbage-out" is even more relevant today. The engineer must ensure that the results presented are realistic rather than say "the computer said so" without question. I went through college using a slide-rule; you did the sums but you didn't know where the decimal point was; you had to have some idea if the answer was 0.56, 5.6, 56 or 560. You had to have a feel for the expected result. The results presented today are extensive; they can be viewed as columns of number and, more conveniently, graphically. They should be looked at from all angles to determine consistency. Further analyses can be made to gain insight into the sensitivity of the result by varying some key parameters.

Use of today's sophisticated analysis solutions requires clear thinking by the engineer to formulate the problem, build the model with sufficient detail (but not irrelevant trivia) and then rigorously inspect the results to be certain you believe what you see!

Dr David Haines, F.I.Mech.E, C.Eng.
Chairman

CMPIC Cable Management — New Venture

CMPIC - Cable management solution set to make savings

IOCS has been selected by Cloudis Ltd (UK) to distribute its CMPIC (Configuration Managed Projects Integrated Cabling) solution. CMPIC is a sophisticated application for the management of cables. Widely used in the ship building and engineering/construction sectors CMPIC plugs a crucial gap between engineering, who design the cable routings, and production who manage the installation and commissioning process. It covers all aspects of cabling from design through to testing. Used on projects with more than 30,000 cables CMPIC has shown savings in materials, manpower and re-work coupled with immediate reporting.

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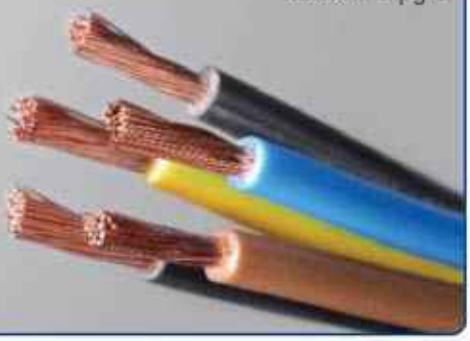

FM2C2 Connecting Flowmaster to CAESAR II — New Product

CAESAR II force-time history data can now be extracted from a Flowmaster transient analysis using IOCS' FM2C2 product. This simple to use stand-alone program takes pressure-time data from a Flowmaster analysis and outputs the force-time (.frc) file needed by CAESAR II for a dynamic pipe stress computation.

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CADWorx Discovery Tour — Events

Discovery Tour COADE
CADWorx Plant Design Suite

IOCS Asia Pte Ltd and COADE Inc co-organised the CADWorx Discovery Tour at RSYC (Republic of Singapore Yacht Club) on 5th December 2007 as part of COADE's tour in South East Asia. This seminar was an initiative by COADE Inc to introduce the new capabilities and future directions of CADWorx Plant Design Suite 2008, to their world wide clientele. It attracted 75 participants; largest crowd in Asia Pacific, from the CADWorx community and other non users in the region.

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Courses

IOCS run a regular schedule of training courses for CADWorx, CAESAR II, PVElite, Flowmaster and other engineering solutions. Please check our web-site for latest news **www.iocsasia.com** or drop a line to **education@iocsasia.com**.

Flowmaster Liquid, Gas & Hydraulic Network Simulation — *Process & Power*

A powerful tool for Process Safety.

Bhopal, Flixborough, Piper Alpha, Texas City Refinery, Exxon Valdez.....

Industrial accidents continue to happen. Inquiries are held and the cause of the accident is determined through exhaustive re-construction of the sequence of events. Inadequate procedures, lack of clear responsibility, human failure, poor engineering design, equipment failure, a freak series of failures – these are some of the scenarios of what went wrong which led to the disaster. Process safety is now receiving far more attention and engineers are charged with determining the likely outcome of events due to all manner of "what if" scenarios that just might happen on their plant. Their work may be instigated by the diligence of the management of an operating facility; or required by the owner of a plant still being designed.

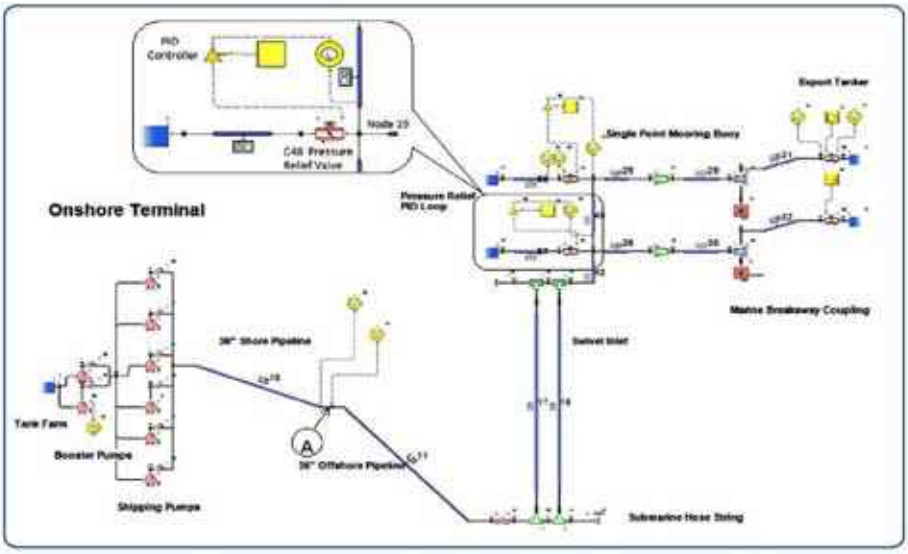
Elevated "pressure" is the cause of many accidents. Higher than normal pressures may be caused by fast events such as valve closures and pump trips, that give rise to pressure surges (water hammer). Pressure waves will propagate through the piping network at typically Mach 1 speeds (1,000m/s). These surges produce forces on the piping leading to abnormal stresses and failures can occur.

As a case study let us examine a shore to ship loading system. From the tank farm the 36" pipe to a single point mooring buoy runs 900m on-shore and then 4.5km underwater. It then rises to the buoy and ultimately through marine breakaway couplings to the tanker. What if there is a sudden disconnect of the breakaway couplings?

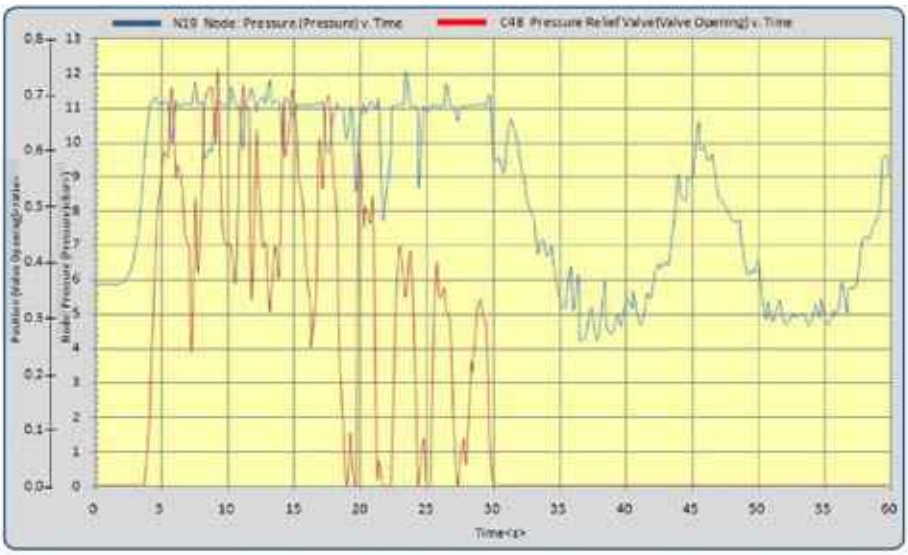
A control strategy using pressure sensing to open relief valves is proposed and then tested using a Flowmaster model. The breakaway coupling disconnect is simulated by fully closing the valves in 10s. All the pumps are tripped 9s after the valves start closing.

The resultant time history shows the pressure increasing upstream of the breakaway coupling and the pressure relief valve opening. This caps the pressure surge increase but there are further fast surges when the valve fully closes. Further plots show the pressure and flow rate at point "A" in the 36" line.

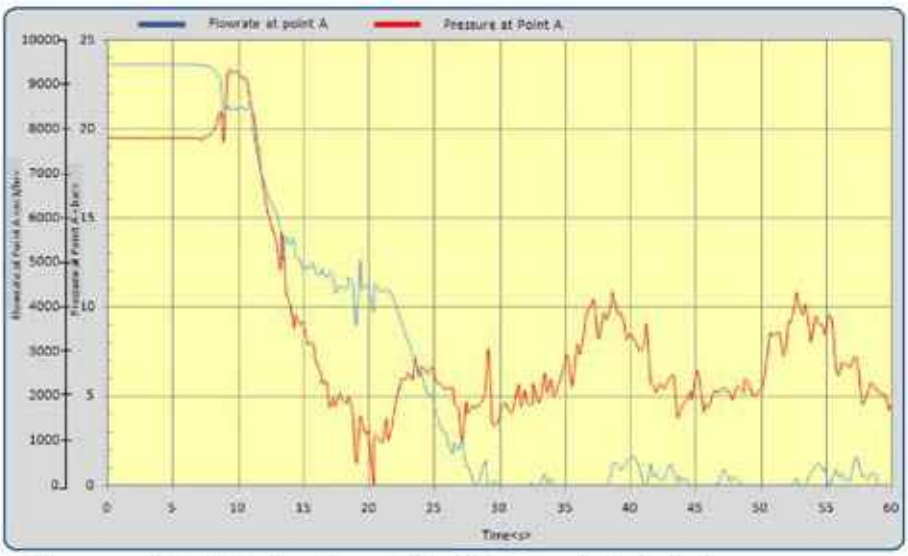
This short example shows Flowmaster to be a powerful tool when used for process safety studies.



Flowmaster network to investigate surges/water hammer in a shore-to-ship loading network.



The pressure at Node 19 is prevented from excessively rising as the Pressure Relief Valve opens.



The surge effects last a long time and it will be several minutes before surges cease.

Flowmaster
Fluid thinking for systems engineers

www.flowmaster.com

CMPIC Cable Management

Process & Power

Cont'd from Page 1

BENEFITS OF CMPIC

- Flexibility in offering both partial and full cable scheduling, routing, terminating and installation facilities.
- Manage multiple project builds within the same database. Reduce time and effort required to maintain different cabling configurations.
- Database can be used as an integral part of through life support for the plant or ship.
- Integration with third party software products including CAD and Microsoft Visio.
- Minimise errors and maximise efficiency because of 2-way real-time access to the database.
- Improve project planning and implementation by using work packages to group cables together for installation.
- Reduce material costs by using cable drumming to optimise the use of large power cables.
- Feedback from the installed data provides management control.
- Reduce data entry and duplication by using libraries of materials & cables.
- One single, simple front-end access provides easy use and minimises training.
- Automatic calculation of % volume fill and weight fill on each path on the nodal network.
- Reports can be generated quickly and easily in specified formats.

CLOUDIS ENGINEERING SOFTWARE

CMPIC – Design

LIBRARIES - CMPIC's library system allows users to define and record information and attributes on items such as equipment, cable types, glands, terminal types, cable trays, ducts and segregation classes. Once entered, the data in the libraries is available to users via drop down lists.

NODAL NETWORK CREATION - Using CMPIC's Nodal Network Creation Module, data is entered directly, or imported from the CAD system.

CONFIGURATION MANAGEMENT (OPTIONAL) - Configuration management features make it easy to amend the cabling design without the costs and potential errors that duplication of information can cause.

DEVICE SCHEDULING - CMPIC's Device Schedule holds information about device type, location, and distance from the nodal network, number and types of terminals and type of entry.

CABLE SCHEDULING - The Cable Schedule holds information on cable numbers, usage, segregation class, type, nodes, cable type and connections. To create a schedule only basic information on the cable number is needed; further details are added as it becomes available.

ROUTING - CMPIC supports both manual and automatic routing with or without a CAD interface. The user can decide how best to use the CMPIC solution to support the project.

CHANGE MANAGEMENT (CABLE ROUTE APPROVAL) - CMPIC ensures that cable routes are approved before installation. Before approval, the design team can still make changes. Afterwards, all modifications are subject to a change control process.

TERMINATIONS - CMPIC holds comprehensive information on cables in its Libraries and matches these against the terminals specified in the Device Schedule. Once design is complete, a termination report is available to aid installation.

CHANGE MANAGEMENT (TERMINATION APPROVAL) - The status of all cable terminations can be seen at any time using CMPIC's Change Control module. The approval process can be hastened by viewing approvals "by device" rather than "by cable".

CMPIC - Production

INSTALLATION PLANNING & CABLE INSTALLATION - CMPIC can be used to create 'work packages' against which cables, that can be grouped in many different ways, can be allocated for installation together.

DEVICE INSTALLATION - Reports give you all the information needed to manage the process successfully, including status, and feedback checks.

CABLE DRUMMING - Schedules and reports reduce wastage and control materials usage. This module includes drum optimisation facilities.

MATERIAL & STORES CONTROL - Stores control provides an accurate inventory of all cables supplied and used on a project. Quantities entered into CMPIC at the design and installation phases are compared with actual usage.

TERMINATIONS - CMPIC creates reports and answers on-line queries to simplify and improve the testing process. The user can 'tree walk' through a system to check connectivity and look for loops.

STANDARD REPORTS - CMPIC has a large number of standard reports and screen queries that provide information at a summary and detailed level. Double click functions enable 'drilling down' to more detailed information.

VISIO INTERFACE - CMPIC has an optional standard interface to Microsoft's Visio software for the production of cable connection diagrams directly from the CMPIC database.

READ ONLY OPTION - CMPIC has a read only web-enabled version of its user interface which has a Windows look and feel. This is a very friendly way for people, who are infrequent users, to view data about cables.

ADDITIONAL OUTPUTS - Outputs are provided to Cable Marker systems for the production of cable tags and labels.

www.cloudis.com

CADWorx Design Review 2008

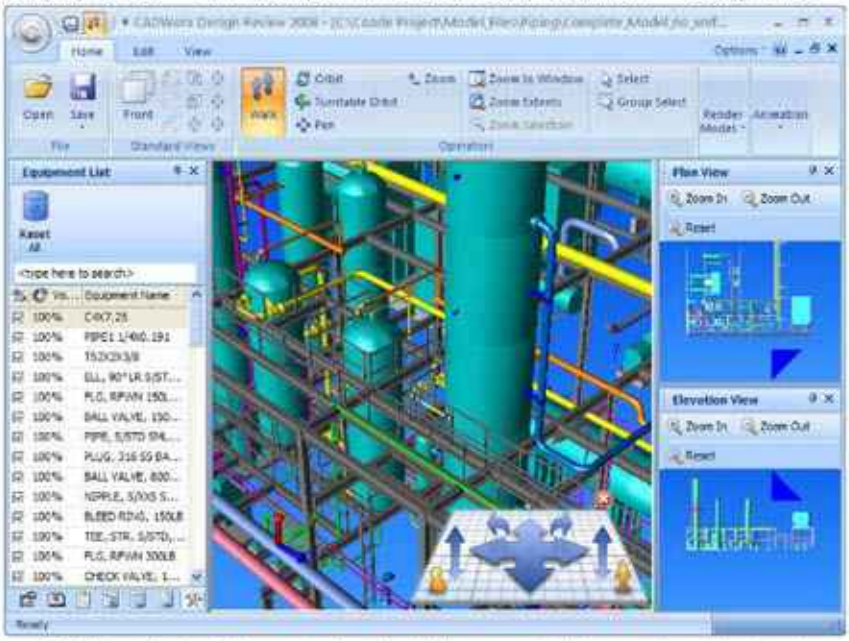
New Product

COADE Releases new CADWorx Design Review 2008 for fast, efficient Plant Design Model Review

COADE has announced the release of CADWorx Design Review 2008, the first product developed specifically to provide faster and easier review of CADWorx and ancillary plant design models by designers, project managers, facility owners and other stakeholders involved in the review, modification and approval of the design prior to fabrication or construction.

CADWorx Design Review makes collaboration efficient and fast because each stakeholder can see an accurate 3D model of how the design will look when completed, and its highly intuitive, interactive tools make it easy to produce review deliverables such as markups, comments and red-lining. It reduces the need to interpret the design using cumbersome paper printouts and other non-interactive tools, saving time and helping lessen the risk of overlooking design errors that would cost much more to fix later during fabrication and construction.

Design Review, you can easily create informative and visually stunning animated models, choosing desired settings for color, transparency, shadows, layers, specs and other elements. You select an animation path line and can easily adjust it at any time to view the model in any combination of the six degrees of freedom plus yaw, pitch and roll. Powerful navigation tools provide easy, smooth and judder-free movement around the 3D model during review.



CADWorx Design Review puts the affordable power of design and model review in the hands all project stake holders.

The program converts even large files quickly and compactly, producing review files that are up to one eighth of the original model size. It automatically includes all cross-referenced (X-REFed) files into the review model, eliminating the slow task of individually loading the separate model files that make up a complete design. CADWorx Design Review provides full integration with CADWorx Plant, providing the same model information as in a CADWorx design session, including descriptions, line numbers, weights and other plant design data.

COADE ENGINEERING SOFTWARE
www.coade.com

CADWorx Discovery Tour - December 2007

Events

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The event started off with a luncheon where participants got to network with other professionals in the industry and with the presenters from COADE Inc.

Dr David Haines, Chairman of IOCS Pte Ltd and Mr Bill Evans, VP & Co-founder of COADE Inc, both gave an introduction speech to kick off the event.

This was followed by an enriching and informative presentations from Mr John Brinlee, Sales Manager and Mr Joe Dixon, Product Manager both from Plant Design Solutions team.

The topics covered for CADWorx included recent key enhancements, P&ID, fieldPipe and the future of the product. The bi-directional links with COADE's pipe stress analysis solution, CAESAR II was also demonstrated to the attendees.

The crowds were very interactive and constructive questions were asked to help them to have a better understanding of CADWorx to fully utilise the features and capabilities.

Highlights of the day

Top CADWorx User Award was presented to HS Compression & Process Pte Ltd by Mr Bill Evans.

Ms Cheong Oi Sin, Engineering Coordinator, received the award on behalf of their organisation. They were chosen for their extensive and comprehensive application of CADWorx Plant Professional in their projects.

Contest

A contest was also created to encourage participants to share their views, personal experience and reasons for choosing CADWorx as their preferred plant design solutions.

Hence, after rounds of judging and careful considerations, the top 2 entries have been chosen.

1st Prize:
Chen Kate Sam

KEPPEL SEGHERS ENGINEERING SINGAPORE PTE LTD

2nd Prize:
Deogracias Galang

EMERSON PROCESS MANAGEMENT ASIA PACIFIC PTE LTD

IOCS Asia Pte Ltd and COADE Inc would like to thank everyone sincerely for their participation and support in making this seminar a success and will continue to provide you with professional engineering solutions services.
For future event dates and programs, please visit us at www.iocsasia.com

FM2C2 The missing link – Flowmaster to CAESAR II

New Product

Cont'd from Page 1

There is a growing requirement for pipe stress engineers to have good data when transient stress situations are studied. These scenarios include pumps starting or tripping, valves rapidly closing and automatic couplings breaking apart. Process safety is paramount and a full understanding of the pipe stresses in such events is necessary to be certain a transient surge will not cause unacceptable stress levels in the piping or on the restraints.

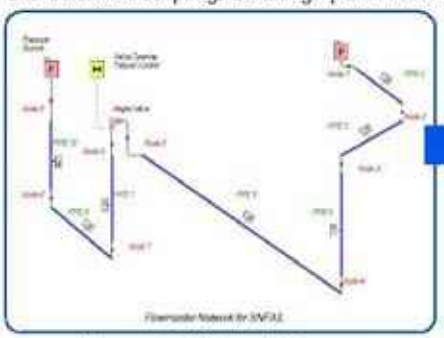
To use **FM2C2** the Flowmaster user first builds the fluid network in the usual manner. When there is confidence in the results from a water-hammer or similar simulation,

FM2C2 can be used to read the Flowmaster results directly from the results stored in the Flowmaster database. The user simply supplies node numbers and diameters through a friendly GUI. To check correct execution the force-time histories can be displayed. Histories from multiple nodes can all be read at the same time.

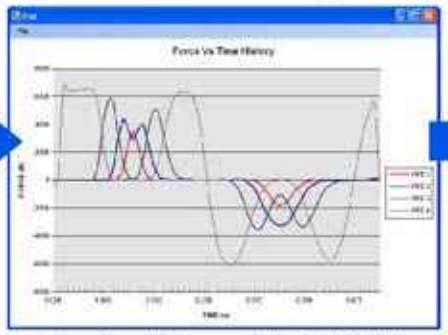
FM2C2 can be used to capture data from any number nodes in the Flowmaster network and for any period of time. FM2C2 may be used with incompressible (liquid) or compressible (gas) networks.

FM2C2 can be purchased on-line from

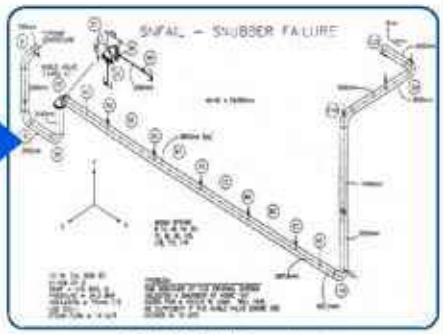
www.iocsasia.com/fm2c2



Flowmaster Network Diagram



Force-time history ready for CAESAR II



CAESAR II Piping Input

CAESAR II - *Version 5.10* Pipe Stress Analysis

New Release

COADE RELEASES CAESAR II VERSION 5.10 FOR PIPE STRESS ANALYSIS WITH NEW CODES, QUICKER GRAPHICS AND 70% FASTER REPORT GENERATION

COADE has announced the release of CAESAR II Version 5.10, an updated edition of the world's most widely used pipe stress analysis package. CAESAR II now has faster graphics and reports and improved productivity features such as smoother and more logical input, more configurations for generating ISOGEN stress isometrics, and easier sharing of reports. CAESAR II Version 5.10 now includes in-line flange analysis that allows flanges to be checked using the equivalent pressure or the NC 3658 method. This makes it easier to pinpoint flanges requiring more detailed review. The latest edition adds new codes, PD8010 Parts 1 and 2, and includes updated stress codes B31.1, B31.3, B31.4, Z662, EN-13480, API-661 and ASCE #7 2005.

"We streamlined CAESAR II's features to increase speed and to make work easier by delivering 40% faster graphics and up to 70% faster report generation," explained Richard Ay, PE, COADE's VP of Software Development for Plant Engineering Solutions. "With these performance enhancements, all types of users should see marked improvements in their productivity."

www.coade.com

PVElite 2008 Mechanical Analysis of Vessels and Exchangers

New Features

New Features

- ASME code 2007 updates including those to material properties.
- ASME U-1 Forms can now be automatically generated in MS Excel format.
- The ability to generate tubesheet layouts for shell and tube heat exchangers.
- Improved nozzle placement tools makes the modeling of angled/hillside nozzles and nozzles on nozzles much easier.
- Canadian 2005 seismic and wind codes added.
- Added/updated the Australian wind/seismic codes.
- Added option to combine wind and seismic loads for horizontal vessels (this was already possible for vertical vessels).
- The European EN 1991-1-4:2005 (E) wind code has been added.
- Improved graphical representation of gooseneck nozzles located on bottom heads with can have piping attached to them.
- Standard nozzle loads stored in the look up files can now be automatically divided for analysis into sustained, expansion and occasional categories, by specifying multipliers.

Products that interface with PV Elite

- CADWorx Equipment - Import and export your PV Elite vessel models to and from this parametric equipment modeler working within the AutoCAD environment, with all the tools needed to easily model 3D equipment for plant design.
- Foundation3D (www.dimsoln.com) - Transfer data from your PV Elite file to this foundation design software.
- HTRI (www.htri.net) - Import heat exchanger data automatically after process and thermal design.

www.coade.com

Electronics

GraphiCode *"Tools for PCB manufacturers"*

GC-PowerPlace is graphical CAM software for captive and contract PCB manufacturers. GC-PowerPlace accepts Gerber data along with an ASCII BOM file to create and verify assembly equipment programs off-line. Centroids are extracted automatically with sub-micron precision. GC-PowerPlace eliminates on-line assembly programming and verification. Typical Return-On-Investment (ROI) is less than 3 months.

GC-PowerStation is CAM software for intelligent PCB fabrication. It combines ease of use with powerful functionality, providing total control of manufacturing data. With GC-PowerStation, PCB manufacturability is verified up-front; saving weeks of costly revision spins. You receive the necessary tools to build the board right the first time.

GC-CAM Edit meets the needs of PCB designers and CAM operators who require convenient design modification capabilities. It features all the powerful panelisation and editing tools necessary for PCB photo-plotting, drill and rout, stencil manufacturing, and basic design modification.

GraphiCode

www.graphicode.com

ScanCAD *"Simplifying Complex Technology"*

Since 1990, over 900 customers in 39 countries have utilized ScanCAD's powerful family of low cost, flat-bed scanner based tools for inspection and data creation in the electronics, photo chemical machining, semiconductor, solar, fuel cell and textile industries.

PCB Assembly
- Automated PCB Process Control
- First Article Inspection & SPC
- Solder Paste Inspection
- Stencil Inspection & Screen
- Offline Component Vision Data Generation
- Glue, Hole, Adhesive Inspection
- Skip Mark Mapping

PCB Design & Fabrication
- PCB Fabrication/Reverse Engineering
- Film/Photo Tool Inspection
- Drill File Data Creation
- PCB AOI Inspection
- Hole Inspection
- Design Analysis Tools (EMI, Rule Check)
- Flying Probe Tester

Hybrid Microcircuits/ Semiconductor Packaging
- Automated PCB Process Control
- Epoxy, Via, and Via Fill Inspection
- Ball and Bump Placement Inspection
- Solder Paste Inspection
- Wire Bond Inspection
- Film/Photo Tool Inspection
- Flying Probe Tester
- LTCC,HTCC Hybrid Inspection
- Stencil Inspection & Screen
- Skip Mark Mapping

Stencil, Mask and Screen Fabrication
- Automated PCB Process Control
- Parts Inspection
- Stencil Inspection & Screen
- Film/Photo Tool Inspection
- Phototool Data Creation

ScanCAD INTERNATIONAL

www.scancad.com

T|Tech

The Quick Circuit System is a desktop prototyping solution used in the design phase of a product. By bringing prototyping methods in-house it affords the engineer a valuable medium for saving both time and money. The Quick Circuit prototyping process is a subtraction process, milling away the unwanted copper while leaving pads and traces needed for testing. With the ability to produce accurate and quick circuit board prototypes directly from your CAD package's data, accepting Gerber, DXF, HPGL & Excellon. The Quick Circuit can drill, mill, and route mill traces/spaces as fine as .004"making it perfect for producing analog, digital, or RF/microwave prototypes. The Quick Circuit has a variety of specifications tailored to the needs of the engineer such as; variety of spindle speeds, different table sizes for different board sizes, serial or USB port connection, and electronic or pneumatic Z-axis drive.

T|TECH Quick Circuit Prototyping Systems www.t-tech.com

NAG Calling MATLAB users

R & D

The "NAG Toolbox for MATLAB" allows MATLAB users to call NAG's highly regarded numerical routines directly from within the MATLAB environment. The Toolbox gives access to increased mathematical and statistical functionality. The NAG Library is the largest and most comprehensive collection of mathematical and statistical algorithms available today. It is used by many of the worlds most prominent finance houses and institutions, by academics in R&D and education and many other industries because of its reputation for quality, flexibility and robustness.

www.nag.co.uk

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Products:

COADE
CAESAR II, PVElite, TANK, CADWorx / P & ID, CodeCalc
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Flowmaster
Liquid, Gas & Hydraulic Network Simulation
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