GLOVIA G2

HIGH-TECH MANUFACTURING

CrescentOne | 2022

CRESCENT ONE
ERP DRIVING INDUSTRY 4.0

GLOVIA G2

HIGH-TECH
MANUFACTURING

As a high-tech manufacturer, your needs have grown more complex and increasingly urgent. You must manage a rapidly growing customized product base. You must respond to customer demands on time and on budget. You must gain visibility into all your operations and synchronize your supply chain. You must also provide immaculate service.

Time to market, response to customer demands, reduced costs and top quality are of increasing importance given the increased emphasis on manufacturing, which yields increased potential for competition. At the same time, this increased emphasis on manufacturing may provide a greater supplier base.

CrescentOne's extended manufacturing ERP software suite can help you achieve these objectives efficiently and cost effectively by enabling you to select from more than 70 modules to fit your manufacturing operating environment and meet customer expectations.

For example, our Factory Planning and Shop Floor Dispatch modules work together to allow you to provide instant, accurate order promise dates while utilizing your resources to keep your plant floor running at optimal productivity.

The flexibility and adaptability of GLOVIA G2 will allow you to manage and improve every aspect of your business with one proven solution to meet today's business needs and to support your system needs as your company, products and industry grow and change.

We welcome the opportunity to discuss your business issues with you and our potential solutions to those issues. In the interim, we invite you to visit our website at **www.CrescentOne.com**.

Sincerely,
Your CrescentOne Team

THE CUSTOMER
IS ALWAYS RIGHT

CrescentOne's extended enterprise resource planning (ERP) software suite, GLOVIA G2, is a true end-toend solution designed to meet the complex requirements of the high-tech industry.

Rather than presume one way of manufacturing or forcing a solution through the rigidity of a traditional ERP system, CrescentOne developed a powerful yet flexible solutions framework that supports the actual ways in which manufacturers operate—including concurrent or progressive engineering and simultaneous mixed modes of operation. CrescentOne software reacts to product and project changes in seconds to rebalance supplies, resources, and demands to keep you moving forward.

The customer is always right
But it is incumbent upon the manufacturer to inform the customer of the options and information of which they may not be aware.

As a high-tech manufacturer, you must not only contend with greater global competition, increasing customer demands, and the need to improve productivity and efficiency, you must also manage bids and estimates for products they have never produced before, manage extremely difficult, ongoing changes in engineering, and control costs, resources, and services for highly complex product lifecycles with long lead times.

The modules in our manufacturing ERP software capture the data and provide actionable solutions incorporating PDM integration, inter-company transfers, outside processing, target costing, consignment, Kanban, eKanban and more to create processes that meet your high-tech manufacturing goals.

Manufacturers that use GLOVIA G2 have all the tools to optimize and analyze information in order to realize significant operational benefits, including increased on-time and on-budget deliveries and substantial reductions in customer lead times. Stateof- the-art collaborative technology allows you to do real-time business with other divisions as well as external suppliers and partners wherever they are located. GLOVIA G2 is the ideal solution for you to meet every-day process needs and challenges and remain focused on overall long-term business goals in manufacturing, projects, contracts and services.

CrescentOne's success stems from our decades of experience with high-tech manufacturers. We have always made it a priority to develop the necessary resources to address the growing demands of our customers and the increasing demands put on them by their customers.

"GLOVIA G2 was built from day one to be a real-time solution for manufacturing."

Ted Rohm, Senior ERP Analyst, Technology Evaluation Centers

CHALLENGES IN
HIGHTECH MANUFACTURING ENVIRONMENTS

OEMs competing on the international market for high-mix, low-volume, high-complexity products have been outsourcing the manufacturing of sub-assemblies and larger non-core submodules to strategic suppliers for quite some time and are now increasingly outsourcing the design and development of the equipment they manufacture as well. What they're doing in fact, is giving suppliers full responsibility for these modules, from design through to manufacturing, similar to the methods used with Boeing 787 and Airbus.

This shift is driving suppliers to push their own boundaries in terms of feasibility and responsibility, and to extend their reach across international borders in order to tap into new, foreign markets.
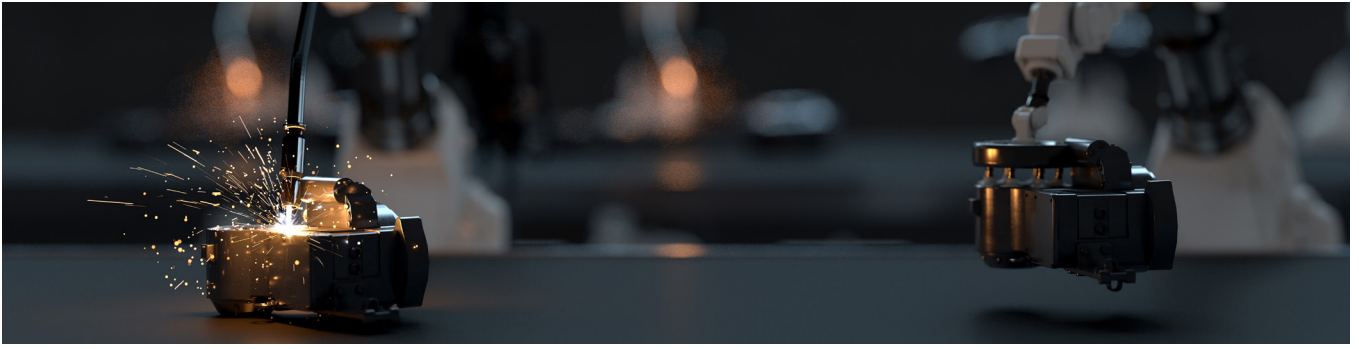
At the same time, high-tech and manufacturing companies are playing a prominent role in the digital – industry 4.0 revolution. While high-tech companies are creating new technologies to explore new possibilities, manufacturing companies are going one-step further by using these technologies to create new solutions that make possibilities a reality. From connected cars to smart farming and digital aviation to smart buildings, the high-tech and manufacturing sectors are at crossroads on their journey to the new digital revolution.

Three fundamental changes are required to accelerate this journey in the right direction:

- Shifting focus from manufacturing products to creating solutions
- Embracing a global outlook
- Fast-tracking research and development and capability building

As a result, today's high-tech manufacturers manage an increasingly complex and sensitive balance of priorities in an increasingly complex and demanding marketplace. To be successful, there are five mission-critical areas in which you must excel:

1 **Managing Change**

2 **Managing Communication**

3 **Managing Costs**

4 **Managing Resources**

5 **Managing Services**

FIVE MISSION-CRITICAL AREAS

① MANAGING CHANGE

High-tech manufacturers must be able to plan for and react to an increasing volume and variety of change. In engineering, the product changes constantly due to material availability and costs, as well as new and enhanced material, all of which impact supply and production. In sales, customers change their minds on the configurations of their order and you must be able to respond in a multitude of ways.

Consequently, a huge part of the problem is to keep production synched with engineering and supply synched with production—managing an entire project to deliver a product on time and on budget. The most accurate, accessible information is useless if the environment it supports is not designed with enough flexibility and integration to accommodate the inevitability of customer and engineering changes.

② MANAGING COMMUNICATION

Complex, long-term high-tech projects inevitably involve numerous departments, groups within departments, and suppliers and subcontractors many of which might operate in various information "silos."

Whereas previously Engineering would complete the design to customer requirements then forward the Engineering Bill of Materials, the EBOM, to Manufacturing to develop the Manufacturing Bill of Materials, the MBOM, to represent the way the product is to be built - with each department working to their individual projects - today's concurrent engineering / manufacturing mode of operating requires a progressive design / build environment with all working to the same project. This enables real-time communication and information flow within your company and throughout your entire supply chain.

③ MANAGING COSTS

Today's contracts and sales orders are uncertain, shorter term, smaller in volume and extremely cost sensitive. Because of change and other unknowns in high-tech projects, predicting and managing costs is an inexact science at best. Yet you need to make the fastest, most accurate bids to your customers and prospects and still maximize profitability.

Contract-based manufacturers have little choice but to shore up new business opportunities and increase competitiveness by creating quality products and services in shorter cycle times to meet rapidly changing market conditions and to secure bids with greater confidence. You need visibility and control of all project lifecycle costs—from the suppliers through manufacturing, out to customers and into the aftermarket, including keeping your customers aware of continual product developments and enhancements.

4 MANAGING RESOURCES

High-tech manufacturing is all about balancing interdependent processes that impact each other. The drivers and constraints of projects can be hard to identify and always change as the project proceeds. Initially, design engineering time may change, then frequently critical manufacturing resources may be delayed — for instance, a singular high tolerance machining center, suppliers may deliver late, and so on.

At the same time, experienced installation and field service engineering teams are not being properly scheduled for their functions, which may result in impacts to other customer installations. Usually, both internal and external resources—materials and personnel— are involved in a project and effective scheduling saves time, money, and helps maintain margins. To know that activities will change is one thing. To deduce the impact on related activities and ultimately the full project is the real name of the game.

5 MANAGING SERVICES

Manufacturers are realizing more and more that in addition to installation support, aftermarket product support including field services is critical to win further business and is a major revenue opportunity. Product complexity and channel proliferation have increased the difficulty of maintaining organizational knowledge and competency in all relationships at all times.

Still, competition in this area is cutthroat and the slightest edge in services can mean all the difference in acquiring—and retaining—new and existing customers. High-tech manufacturers need sophisticated tools to manage and track service, materials and personnel over the long, detailed lifecycles of their products.

BUSINESS CHALLENGES
& BENEFITS

Day and night, high-tech manufacturers confront important opportunities and high-pressure decisions that have direct and indirect consequences on their bottom line. GLOVIA G2 has innumerable strengths and advantages that automate and enhance the competencies you need to be as successful and profitable as possible:

- Project Management and Analysis
- Design and Engineering
- Factory Planning
- Planning And Controlling Key Resources
- Post-Sales Service and Support

Project Management & Analysis

The nature of managing any project is timely coordination of a series of complex, interrelated tasks often performed by a myriad of resources. Raise this to the level of the manufacture and installation of a complex piece of equipment or system and you have an enormous job on your hands. Add the fact that most ERP systems are built on a work-order model and you have a project manager's nightmare.

A well-designed project plan that provides visibility across the multiple activities and organizations involved in the development, production, and installation of a high-tech product is critical to successful, on-time, on budget completion.

GLOVIA G2 enables you to manage customer projects and contracts profitably by coordinating program resources and activities. Our end-to-end solution manages everything from defining the project and developing realistic estimates and bids to optimizing the use of resources and managing costs. You can begin a product cycle and track all costs while GLOVIA G2 provides you with total, enterprise-wide, real-time visibility into your project status.

Dedicated accounting tools help you avoid runaway costs and enable profitability whether you are managing a single project or a complex, multiproject program. You can also optimize the use of project resources, plan activities and tasks, synchronize dates and determine the impact changes will have on project completion and profitability.

CAPABILITIES AND BENEFITS INCLUDE:

- Report ETC and EAC by project and program at any point in time
- View costs by project and program regardless of fiscal period or by fiscal period for one or more projects
- Deploy project accounting for accurate visibility and control of project performance
- Control integrated project definitions for any type of project no matter how complex
- Enable seamless integration with Microsoft Project using a bi-directional interface, which helps you develop and analyze project plans, create reports and coordinate activities
- Apply data mining to find the detail needed to support all costs
- Apply multi-level planning tools including date synchronization, impact analysis, and simulation

DESIGN AND ENGINEERING

To remain competitive you need to synchronize your engineering, manufacturing, quality and materials teams, as well as your suppliers, with ever-changing product information. The need for excellence in managing change is brought to bear most in engineering, particularly in the design process. Decisions made in this phase affect every downstream process.

The rigidity of traditional systems makes it extremely difficult to configure products and manufacturing processes in an environment where all specifications and parameters are not fixed.

GLOVIA G2 generates a product structure that builds material and service resources progressively for the most efficient and effective planning. With progressive engineering, your planning is not tied up in engineering and you have much greater product flexibility. GLOVIA G2 helps you manage your product design processes effectively, control costs, coordinate downstream activities, and deliver products on time and on budget.

Our solution provides manufacturers with a centralized repository for all product-related data— including specifications, BOMs, routings and resource data, project and asset structures, as well as related documentation—to help speed new product

"The CrescentOne solution was built to solve complex manufacturing requirements and to process transactions in real time."

Ted Rohm, Senior ERP Analyst, Technology Evaluation Centers

development, compress time-to-market, reduce development costs and manage large product portfolios.

Because GLOVIA G2 incorporates progressive design and engineering within the ERP system, a manufacturing facility engineer can continue to tweak a product while still accessing features like Costing and Sales Quotes without finalizing the product in the Engineering database. Progressive engineering enables tight schedules to be maintained, even while end item discussion continues. At the same time, all acquired components remain protected, dedicated to that yet-tobe- defined end item so that no time and material costs are unaccounted for.

CAPABILITIES AND BENEFITS INCLUDE:

- Increase productivity and efficiency with progressive engineering cutting months out of lead times

- Define service items, including design engineering and product installation, with the same accuracy and precision as your material items and easily incorporate into a single project plan

- Employ the centralized, integrated product information repository that ensures quality and reduces costs

- Apply powerful estimating and simulation capabilities for fast, accurate sales quotes and bids

- Use Local Structures to reduce costs and risks of product and engineering changes

- Support design, engineering, manufacturing, post-sales service and financial accounting processes to provide you with total control of the entire product lifecycle

FACTORY PLANNING

In today's fast-pace, ever-changing world of high-tech manufacturing, you need a 360-degree inside view of processes, something that rigid traditional ERP systems won't provide. Unlike traditional ERP solutions that were keyed to financial needs, GLOVIA G2 was built from conception as a manufacturing-based solution.

GLOVIA G2 has true, real-time production planning and scheduling capabilities, with Factory Planning as a seamless extension of GLOVIA G2's real-time database, so production planning is always based on a single, up-to-the-minute data set. This close integration is unique among ERP solutions.

As events occur throughout your company – orders entered, work orders completed, inventory received – they are reflected in the GLOVIA G2 database and the production planning data model. This synchronization ensures that the data is an actual reflection of your factory status and not an outdated snapshot, allowing modification of the floor schedule to suit the changes.

Real-time feedback is a cornerstone of the Factory Planning module, providing manufacturers with crucial information at the exact time it's needed. Rather than relying on batch processing during non-peak hours, GLOVIA G2 allows users to process master production schedules and other important functions multiple times per day, providing an up-to-the minute picture of the entire operation, without the need to shut down the system.

GLOVIA G2 enables the seamless execution of the production plan by having shop floor terminals interrogate the application for the correct and current work queue at each work center. The operators simply select the correct item from the list, which "starts" the operation. You can also call up data, drawings, work instructions and additional information from the remote terminal.

CAPABILITIES AND BENEFITS INCLUDE:

- Increasing machine and resource utilization
- Decreasing overtime and idle time
- Eliminating bottlenecks
- Lessening repair/ maintenance impact
- Reducing inventory levels
- Reducing cycle times
- Improving on-time delivery and customer service

Factory Planning also supports a wide range of planning scenarios, such as:
- Scheduling directions—forward, backward, and mixed
- Flexible interactive settings of constrained resources
- Simultaneous checking of resources (capacity, inventory, and tools)
- Full optimization to reduce setup times
- Full optimization to improve the flow through complex processes
- Instant re-optimization after machine breakdown or inventory shortage
- Planning based on labor skills, resources, and/or team-based manufacturing
- Scheduling groups—used for mixedmode manufacturing scenarios where orders for certain items have priority over orders for other items

PLANNING AND CONTROLLING
KEY RESOURCES

Material and resource management is highly critical in effective high-tech manufacturing and is one of its biggest challenges. You must know at any given moment exactly what materials, resources and skills are needed, their availability, and exactly how much they will cost. This crucial information, managed in the planning systems, can change at any time, even up to the day you ship the end product out the door.

The recording of any and all changes to the BOM is imperative. The impacts from these changes must be calculated and analyzed immediately. Unfortunately, in many manufacturing environments—particularly those that incorporate frequent changes into their processes—this vital need goes unmet. In even more cases, the information systems used to communicate with other departments are not updated. These lapses can produce havoc should a product failure occur at the customer site.

GLOVIA G2 provides a sophisticated set of planning tools for material-based, service-only, and service plus-material projects. Materials and related skills and services are integrated in local structures kept under an identifier—as opposed to the strict, material-centric recording in traditional BOMs. Our comprehensive, enterprise-wide solution helps you manage suppliers, control inventory levels, and improve your

supplier relationships without risking customer service. The solution supports the entire procurement process including prioritizing approved suppliers and searching for and selecting new suppliers, developing and executing supplier contracts, managing purchase orders, and supporting outsourcing strategies.

GLOVIA G2 balances purchases across multiple suppliers and tracks order status and supplier progress against contracts and sales orders. You get the right materials to the right place at the right time—at the right price while meeting all quality specifications.

CAPABILITIES AND BENEFITS INCLUDE:

- Coordinate the lead times of your suppliers with your manufacturing processes—including sub-assemblies and components—to maximize efficiency and responsiveness

- Enjoy total flexibility in supplier relationships—as manual or as automated as you need them to be

- Match supplies with demands, which helps you negotiate contracts with committed pricing but flexible delivery schedules

- Achieve complete visibility into materials and services as well as the flexibility to define and track both materials and locations, including full lot and serial number traceability

- Plan and re-plan activities and tasks, synchronize task and material/service delivery dates, and perform impact analysis and simulations to improve on-time completions

- Respond immediately and accurately with full visibility to any change to the product structure or project plan.

POST-SALES SERVICE AND SUPPORT

Products built by complex manufacturers are typically revenue-producing machines for their buyers. Your customers want to purchase a good piece of equipment, machine or system at a good price but also need to know the nature, commitment, and tools that will be used to keep it in production.

Leading manufacturers stress initial product quality as well as responsive and flexible service capabilities for planned support and emergencies. Services can reap tremendous profit. The revenue from aftermarket service activities and field upgrades can equal several times the initial purchase price.

GLOVIA G2 not only helps you win new customers, it can turn your customer service operations into a competitive advantage as well as a lucrative source of revenue. With the CrescentOne solution, you manage all service processes in one integrated system and have total visibility into your activities, status and lifecycle costs.

GLOVIA G2's comprehensive functionality helps you manage all post-sales service activities cost-effectively—including call handling, service quotation, service order management, field service dispatching, installation management, preventative maintenance, service contract management, resource planning, warranty management and so on.

CrescentOne's solution helps you integrate the delivery of projects and products seamlessly and provides customers, service representatives, and field service personnel with real-time, webbased access to urgent and critical information. A "site register" with a dynamic, multi-level BOM, complete with effectivity, lot and serial number, goes live as soon as you install your product at a customer site. Your service technicians can ascertain the detailed history and company knowledge of an entire product and service relationship.

If you generate a product improvement, you can easily find all of the installations for that product and offer an upgrade accordingly.

CAPABILITIES AND BENEFITS INCLUDE:

- Plan and manage services just like materials

- Manage the delivery and procurement of services and monitor costs more efficiently

- Obtain visibility into both existing and planned field service engineer and material availability

- Plan and execute successful product installations by managing the coordination and delivery of materials, services and other resources including sub-contractors

- Respond promptly and profitably to customer needs for repair— manage the entire service and repair cycle

- Track direct and indirect time and costs of field service engineers to contract and project.

MANAGE

SUMMARY OF BENEFITS

Manage All Requirements
Including data requirements as well as service and material

Manage All Changes
Full Configuration Management, from:
- **As-Designed** (to meet customer demand);
- **to As-Planned and As-Built** (which reflect the consistency between the demand and supply);
- **to As-Shipped** (ensuring that the correct product – down to lot and serial – is shipped);
- **through As-Installed** (which represents the BOM installed in the customer site register);
- **to As-Maintained** (to ensure that all changes to the As-Shipped/As-Installed are maintained by date, lot and serial)

Manage All Activities
Manage variables by way of Projects and Programs and Project/Program Reporting.

Manage Engineering to Manufacturing Progressively
Define As-Designed/As Required using Progressive Engineering to increase efficiency and productivity.

Manage Customer Billing
Invoice customers using Progress Billing Triggers agreed to and pre-defined on award of contract.

Execute Impact Analysis
Immediately and accurately see changes required to demand/supply throughout the product structure and project plan.

Business Partnership
We know that high-tech manufacturers are not looking for a software supplier as much as a solution partner. From the start, we work to establish a partnership based on the ongoing value that we offer to your business. We provide one of the industry's lowest total costs of ownership.

One customer concluded that their CrescentOne investment was 1/10th what they would have paid for the same solution from another provider.

Professional Services
Our services professionals help you realize immediate and on-going value from your solution. We work closely with you to define your strategic plans, operational tactics, and business requirements. We then bring together an experienced team of professionals to deliver a complete business solution at exactly the pace you want, fully leveraging your existing investments so you gain tangible benefits right away. We come in, get you up and running—and in control.

ABOUT
CrescentOne

CrescentOne is the leading supplier of ERP solutions for the discrete manufacturing industry. The GLOVIA G2 ERP platform offers complete solutions for automotive, capital equipment, electronics & electrical engineering, and the high-tech industry. Thanks to these extensive solutions, companies in the manufacturing industry can manage the entire life cycles of their products – from design, production and delivery to installation, maintenance and support and implement Industry 4.0 concepts and solutions.

As of September 2021 CrescentOne is part of FOG and the Constellation family. FOG is an independent operating group of Constellation Software Inc., ("CSI") which is listed on the Toronto Stock Exchange [TSX-:CSU]. CSI and FOG acquires, manages, and builds software companies in a variety of vertical markets. Constellation Software is an international provider of market-leading software and services to a number

of industries. Their mission is to acquire, manage and build market-leading software businesses that develop specialized, mission-critical software solutions to address the specific needs of the particular industries.

The company was founded in 1995 to assemble a portfolio of vertical market software companies that have the potential to be leaders in their particular market. Since then, they have grown rapidly through a combination of acquisitions and organic growth, and established a strong constellation of companies with a large, diverse customer base.

They have six operating groups which currently service customers in over 100 different markets worldwide. With headquarters in Toronto, Canada, and offices in North America, Europe, Australia, South America and Africa, they have over 25,000 employees generating consolidated revenues exceeding US $4 billion.

CrescentOne
HQ global: Los Angeles, US

HQ EMEA: Eindhoven, the Netherlands

Solutions: Manufacturing ERP software and solutions for discrete manufacturers

Implementations:
around 1,000 worldwide

Active member in innovative Industry 4.0 initiatives in the Benelux, such as Industry 4.0, Brainport Industries Campus (BIC), Factory of the future, Smart Connected Supplier Network (SCSN) and PXL Smart Factory (Diepenbeek, Belgium)

Constellation Software, Inc.
- 19.000 Employees
- 1.000+ Offices
- Headquarters in Toronto
- 125.000 Customer in 100+ countries
- 700+ Acquisitions since 1995
- $ 4.5 Billion in revenue
- 20% 10 year CAGR (Compound Annual Growth Rate)

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