GEM4Tools

SECS/GEM for PLC-Based Equipment Controllers

GEM4Tools™ provides HMI/PLC-based equipment controllers complete SECS/GEM capabilities that will satisfy the requirements of any semiconductor, solar, LED or MES manufacturing facility. You can integrate GEM4Tools to your equipment controller's OPC server in a matter of days.

- Leverages the popular OPC standard for fast and easy integration.
- Can be used in your own equipment control solution, or any HMI/SCADA software package that support OPC.
- Most GEM capabilities are available out-of-the box; others are easily implemented with straight-forward configuration and no coding.
- A simple, powerful API makes it easy to extend GEM4Tools to accommodate any requirements beyond the GEM standard
- GEM4Tools implements basic SECS/GEM communications and control as well as more advanced alarm reporting, data collection, and recipe management.

Why GEM4Tools?

Getting the most from the OPC standard

GEM4Tools was specifically developed for HMI/PLC--based equipment controllers, using the OPC standard as its foundation. OPC is the interface of choice for many OEMs and factory automation/process control solution providers, worldwide, which means your solution will rest on a proven standard and best practices. GEM4Tools works with any DA 2.0 compliant OPC server, whether you have developed your own, or are using one of the many HMI/SCADA packages available, such as:

- Intouch (Wonderware)
- RSView32 or FactoryTalk View (Rockwell)
- SIMATIC WinCC (Siemens)
- Labview (National Instruments)
- Cimplicity or iFix (GE)

Typically, suppliers of SECS and GEM applications have their own proprietary interface that must be used to build GEM capabilities into the equipment control software. Integration time can take months, and requires an extensive background in the SEMI standards. GEM4Tools requires no coding or detailed knowledge of the standards to implement any GEM capability. As an OPC client, it simply needs to be configured to communicate with your equipment controller's OPC server.

Fast yet flexible...

GEM4Tools includes a starter application, which provides a basic graphical user interface that implements all GEM-required operator interactions; you can start GEM communications, set host control, upload/download recipes, and so on. Alternatively, you can embed GEM capabilities seamlessly into your system using a straightforward and flexible API that works in any COM-enabled environment. To extend your equipment's capabilities beyond the GEM standard, you can also use the API to write custom services as needed.

And proven for over a decade...

In the field for over a decade and installed on over 500 tool instances, GEM4Tools is a stable and production-proven application. Whether your equipment is used for single substrate or batch processing, metrology, or back-end processes, GEM4Tools delivers the functionality you need, efficiently and consistently.

What is OPC?

The OPC Specification is a non-proprietary technical specification that defines a set of standard interfaces based upon Microsoft's OLE/COM technology. The application of the OPC standard interface makes possible interoperability between automation/control applications, field systems/devices and business/office applications.

Traditionally, each software or application developer was required to write a custom interface, or server/driver, to exchange data with hardware field devices. OPC eliminates this requirement by defining a common, high performance interface that permits this work to be done once, and then easily reused by HMI, SCADA, Control, and custom applications.

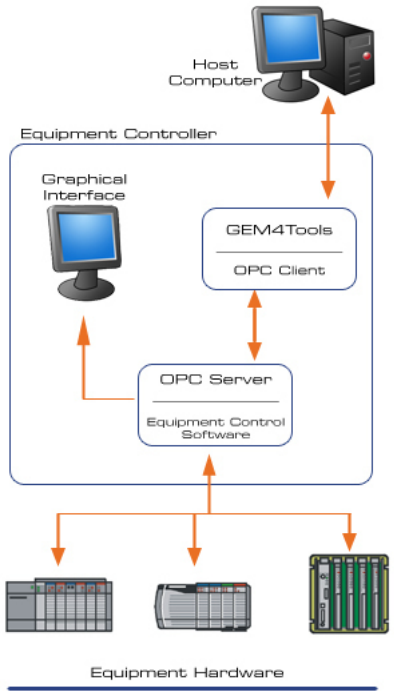
-OPC Foundation 2008
www.opcfoundation.org

Architecture

GEM4Tools is built on three primary components, which simplify design and implementation, improve reliability, and reduce maintenance overhead.

SECS communication driver

The SECS communication driver provides the equipment-to-host interface, automatically managing all SECS-II messages and host communications required by the GEM services. GEM4Tools supports both the SECS-I and HSMS standards, for RS-232 serial or TCP/IP Ethernet® connectivity to the factory MES.



System Architecture

GEM4Tools SECS services

The SECS services communicate with the equipment's OPC server and handle all messaging and logic as defined by the GEM standard. Each service corresponds to a GEM capability, and implements all scenarios defined for that capability.

If your equipment has functionality that goes beyond the GEM standard, you can use the GEM4Tools API to create your own custom services, in any COM-enabled (Component Object Model) language, including .NET.

GEM4Tools database

The GEM4Tools database stores all GEM configuration and runtime information for the SECS services. It lets you quickly and easily characterize your equipment – define the status variables, alarms, collection events, and equipment constants it supports. You can enable GEM capabilities, modify your equipment characterization, and change your SECS-I or HSMS communication parameters at any time, simply by updating the database.

Using GEM4Tools

Configure the GEM4Tools database

- Choose which protocol the equipment will use to communicate with the host (SECS-I or HSMS), and configure required settings.
- Select the GEM capabilities you want to implement immediately. Enable only the services you need, with the freedom to enable others whenever they're needed.
- Characterize your equipment by mapping the OPC Items available in your equipment's OPC Server with the appropriate SECS-II data items, including status variables, equipment constants, alarms, and collection events.
- Once you configure the required data items, GEM4Tools handles all SECS-II messaging automatically. When the factory host sends a SECS-II message, Gem4Tools locates the correct equipment data to send to the host or updates the OPC Item values as needed.

Integrate into your equipment controller

GEM4Tools can be integrated into any solution built with COM-enabled languages, including .NET. All standard GEM capabilities are implemented as COM servers; developers simply use interfaces to the main COM object to let your applications start and manipulate GEM4Tools. With a straightforward API and plenty of code samples to draw upon, GEM4Tools is easy to integrate into your existing solution, whether you use an HMI package or have developed your own controller software.

Extend the standard GEM capabilities to meet fab requirements

Some factories require alternate or additional behavior to what is outlined in the GEM standard. If you need functionality beyond normal GEM capabilities, you can use the GEM4Tools API to extend the standard SECS services or create your own unique SECS services. Custom services can be used in your application like the standard GEM4Tools services.

Create Custom Services

With the convenience of the SECS services and a configurable database, standard GEM functionality is readily available. You can also create custom services that integrate seamlessly with the existing GEM4Tools package in order to satisfy equipment- or customer-specific communication for your equipment.

PLC Compatibility

GEM4Tools provides SECS/GEM communication to any OPC-compatible PLCs including Toshiba, Omron, Mitsubishi, Keyence, IDEC, Allen-Bradley, Eaton, Rochwell, Siemens, GE, and others.

Product Highlights

Features	Benefits
Developed for Windows XP	▶ Supports latest technology from Microsoft ▶ No legacy code to support other operating systems
COM architecture	▶ Can be used in any COM container: C++, VB, and the .NET languages ▶ Highly extensible — either you or a third-party consultant can create additional SECS services for the product
OPC standard leveraged	▶ Fast integration with the equipment controller ▶ Open, published standard is stable and widely accepted ▶ Creates opportunities to use other OPC-based applications
Incremental development supported	▶ Enable only the GEM capabilities your equipment needs, thereby reducing setup time and conserving equipment resources
Easy-to-use configuration database	▶ Configuring instead of coding slashes development time and gives you immediate productivity ▶ Equipment characterization is straightforward and can be updated at any time by anyone
A simple, powerful API	▶ Easy to start and use from your equipment controller application ▶ Allows customization: lets you support SECS-II messages and equipment behavior beyond the GEM standard

System requirements

Operating System
Windows 2000, Windows XP (SP2)
Contact us for future OS support

Hardware
Recommended hardware, RAM, and disk space for operating system

Supported SEMI standards
E4 SECS-I
E5 SECS-II
E30 GEM
E37 HSMS

About PEER Group

PEER Group provides innovative factory automation software solutions and consulting services to the semiconductor, photovoltaic, and electronics industries. The world's best manufacturing companies turn to PEER Group to solve their most challenging equipment automation, data management, and process control problems. With more than 100,000 licenses shipped, we are the world's leading supplier of equipment connectivity and testing products to automated factories around the globe. Our innovative and reliable products and services help lower the cost of automation for high-volume manufacturers and their equipment suppliers. PEER Group is recognized on the following listings: Great Place to Work's Best Workplaces Canada, Branham300, Deloitte Technology Fast 50, and Deloitte Technology Fast 500.

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