

MCG 3905 WINGauge Inventory Management System

The L&J Engineering WINGauge Version 5 Inventory Management System is the latest in a long line of tank gauging and inventory control products from L&J Technologies, Inc. As a state of the art Microsoft Windows application, WINGauge offers multi-protocol, multi-loop, real-time gauging of storage tanks, covering the entire spectrum of storage facilities.

Version 5 was developed with flexibility in mind and the end user can easily customize and fine tune the visual displays with WINGauge's Dynamic Form Generator, customize printed reports with the Dynamic Report Generator, and easily set up field and host communication to products from multiple vendors. Advanced high-performance client/server technology and high-reliability redundant-server configurations are available off the shelf, as well as numerous database, interfacing and external connectivity features.



Tank Detail



Real-Time

Features

- Customizable Graphic User Interface
- Multi-Protocol/Multi-Vendor
- Monitors up to 1000 Tanks on 32 loops
- Multi-Server / Multi-client / Multi-field
- Supports L&J S.M.A.R.T Diagnostics
- Supports L&J Intelligent Field Interface
- Supports Non-L&J Gauges & Protocols
- Sophisticated Connectivity Features
- Plug-in Software Expansion
- Multi-Media and Relay Alarm Outputs
- User-Definable Printed Reports
- Scheduled Automatic Report Printing

Applications

The MCG3905 WINGauge and L&J field gauging equipment are installed in a variety of industries worldwide.

Petroleum	Refineries	Pharmaceutical
Petrochemical	Chemical	Food & Beverage
Water Treatment		Bulk Liquid Storage

Software Features & Functions

Flexible User Configuration

User-customizable Desktop Layout, Form Design and Printed Reports,
Animated Desktop Backgrounds,
Field Loop Interface Control
Client/Server Operation,
Communications Protocol,
Software Plug-ins,
Host Communications,
Alarm and Tank Movement Colors,
Group/Product Codes may be remotely updated via network.
Screen and Report layouts may also be remotely updated.

Dynamic Forms Generator

The system administrator may easily modify the default displays, or even create custom data-entry and tabular display forms. Forms automatically scale to the current screen resolution. Global color *themes* are also supported.

Dynamic Report Generator

Version 5 now has the capability for producing custom printed reports. Using the same technology as the Dynamic Forms Generator, completely user-designed report layouts may be developed and installed into the main program's menus and toolbar. This flexibility allows the MCG3905 to easily handle reporting requirements not accommodated by the standard report library.

WINGauge Desktop

WINGauge now supports a completely user-definable menuing system, and true desktop functionality for accessing the various displays. Users can freely reposition the desktop icons to create custom layouts, and the icons will disappear when not in use to maximize the available display area, very useful for smaller screens. The menu and desktop layouts can be remotely customized over the local-area network.

SiteView Display

Another useful feature is the user-programmable SiteView display. This scrollable, zooming bird's-eye view of a customer's tank farm provides a complete real-time, graphical view of tank levels, temperatures, and alarm status. Site graphics may be provided in .BMP or .JPG graphic formats, and may consist of satellite imagery, CAD or scanned artwork, or even a hand-drawn picture. Virtual tank objects can be applied to each image, using standard drag-and-drop techniques. Multiple views of different portions of a particular facility (or even multiple facilities) may be displayed simultaneously on-screen.

Trending Display

Archived (historical) tank data may be viewed using the Trending Display. This color-coded display will graph multiple data items simultaneously, and a mouse-based pointer system allows the operator to determine the values of the selected data items at any point on the graph, and the time at which the values were acquired. All historical data is stored any of several standard SQL database engines.

Advanced Gauging Module

The Advanced Gauging Module is a key component of the MCG3905 WINGauge. It manages all communications to field equipment and provides precise control of field operations. Up to 32 field loops are configurable for simultaneous gauging with any of the supported protocols, and RS485 2 and 4-wire multidrop modes are supported. WINGauge is frequently used in conjunction with remote serial interfaces over a network (LAN) for additional versatility.

Interface Device Types:

COM port	Multiport I/O
USB port	RS-485
Auxiliary Port	

Communications Parameters:

- Data rate (110 bps to 115 Kbps)
- Parity (Odd, Even or None)
- Auto-retry (0 to 255 retries)
- Intergauge Time (0-5000 ms)
- Interpoll Time (0-5000 ms)
- Gauge Latency (0-500 ms)
- Recycle Time (0-10 seconds)
- RS-485 Multidrop Mode

Communications Protocols:

- L&J Tankway (32nds)
- L&J Tankway (Graycode)
- GPE 31422/31423
- RGL
- Modbus
- Others Available*

*See Ordering Guide for complete options.

Field Diagnostics

For L&J gauge types that support remote field diagnostics (all SFI-series products, including the MCG1600SFI radar gauge) WINGauge will provide both live and historical diagnostic data. This includes, at a minimum, polling rate and loop scan time, field and gauge CPU power, memory status, live and accumulated communications status and many, many other useful pieces of information all relating to the quality of acquired product data and overall gauge field integrity.

In addition, the new L&J IFIC (Intelligent Field Interface) cards are directly supported. For those sites using the MCG3210 card rack, the MCG3905 will continuously acquire field power and voltage data from the IFIC handling each field loop and store this in the system database. Several new displays have been implemented to allow this information to be displayed in tabular and trending form.

Advanced Network Module

All WINGauge network services are routed through the Advanced Network Module. WINGauge systems which are configured as gauge servers use the ANM to provide data services to remote networked client systems. In addition, this module supports high-reliability gauging with automatic failover to a live backup server (this requires the MCG3901 Automatic Switchover Unit.)

Standardized Releases

All WINGauge customers at a given software revision level will receive the same production program code. Clients and servers differ only in their configuration and setup: the actual executables are identical. This is very helpful for license auditing requirements and system upgrades.

Plug-in Module Support

Unique, site-specific, or otherwise non-standard features are typically implemented as a WINGauge Plug-in module. Plug-ins are separate executable modules that are loaded automatically by WINGauge upon system startup. Plug-ins can be added at any time after a system has been installed, and provide a way for a customer to leverage customized features even as the main program is revised or upgraded.

Full-Screen Kiosk Mode

Often it is desirable for a client system to function as a mere data terminal: that is, the user should not be allowed access to any Windows applications or features other than WINGauge itself. Kiosk mode hides the Windows Start Menu, System Tray and Task Bar and allows WINGauge to control the entire desktop.

Access-Control System

WINGauge sports a complete user & group based access system. Users are assigned to functional groups (for example, *maintenance* or *operators* or *administrators*) and access to specific system functions is controlled via administrator-assigned passwords. Furthermore, access can be controlled right down to the level of individual data entry fields (e.g., level, temperature, gauge type, etc.) Access timeouts can be specified on a user or group basis: the system will automatically log off an inactive user to help prevent unauthorized use.

Tank Simulator

Systems which are supplied with the Tank Simulator plug-in will have an extra communications protocol available called *simulated*. Any tank which is set to *simulated* will begin to generate slowly varying levels and temperatures. Alarm generation will occur, and trending data will be stored as well. This is very useful for initial evaluation of the WINGauge product, and also for training operations personnel without having to generate events using live gauging.

Alarm Outputs

When specific alarm conditions occur, WINGauge will generate appropriate alarm sounds. If the system (client or server) is multi-media equipped and has speakers, one of three alarm sounds will be produced depending upon the severity of the alarm condition. These alarm sounds are stored as standard Windows .WAV files and may be customized.

If the gauging server is equipped with an MCG3281 Mini-FIC or other compatible relay device, WINGauge may be optionally configured to close a relay when an alarm condition occurs. Multiple relays can be assigned to different alarm points.

OPC Server

WINGauge now supports real-time OPC operation. WINGauge functions as a standard OPC 2.1-compliant server. This allows any OPC client with proper authorization to access live gauging and configuration information from any point on a LAN or the Internet.

Remote Configuration

All writeable data fields within the WINGauge system can be remotely updated via a WINGauge network client system, Modbus, OPC and the Automatic Configuration Importer plug-in. This capability is very useful for system administrators who want to modify the system configuration in real-time without having physical access to the server.

Pump Logging Subsystem

WINGauge contains a full-featured pump-log. Operators may use the system to monitor product transfers between tanks. Completion of a programmed transfer is automatically determined by the system, and can be set to terminate based upon volume transferred or actual volume, as well as running time and ending time, in any combination. Pump Log information is made available in real-time via the OPC interface for host systems and data archivers.

Database & Connectivity

WINGauge offers numerous connectivity options for accessing live and archival information. In addition to the various plug-ins available for serial and network connection to host system and DCS equipment (i.e., OPC, Modbus, TopTech, Emark, and others), WINGauge also has options to output data in text, Microsoft Access, XML, HTML and several other formats. Custom drivers can be developed for any host communication needs.

During normal operation of a WINGauge server, an export file is generated after each field scan. One record exists in this file for each tank that is scan-enabled, and each contains over two dozen data fields, ranging from the current product level to the previous day's stock data. This file will never contain more than one record per tank.

There is a separate SQL database which maintains long-term storage of tank gauging data is continually updated. This database is used internally for the trending, level history, alarm history and other displays, but may be accessed directly by the user. The user may configure the interval at which new tank data is written, and the specific data fields that are to be stored. This capability is very useful for fulfilling both operational needs and legal / documentation requirements. Any of several standard SQL database engines may be employed, including MySQL, MariaDB and Microsoft's SQL Server. MariaDB is the default.

Help System

The entire user's manual is available in the online help system. This help system provides a wealth of information about the operation and use of the WINGauge gauging system. It is primarily intended for operations and maintenance personnel, and does not include documentation on advanced administrator-level functions.

Common Tank Configuration and Data Fields:

Alarm Generation

Level	HiHi	High	Low	Low-Low
Temperature	High	Low		
Rate	High	Low		
Float				
Movement				
Communications				
Discrete Inputs				
Color Controls				

Volume Configuration

API Table	Strapping Table	Outage Mode
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Volumetrics

Total Capacity	Available Product	Available Storage
BS&W Volume	Bottom Volume	Gross Volume
Net Volume	Volume Correction Factor	Density
API Gravity		

Levels

Product Level	Level SoftCal	Level Offset
BS&W Level		

Temperature

Product Temp	Temp SoftCal	Temp Offset
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Flow Rate

Current Rate	Critical Time	Rate Interval
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Floating-Roof Correction

Roof API	Upper Critical Zone	Lower Critical Zone
Delta Volume		

Tank And Host Communications

Gauge Address	Gauge Type	Loop Number
ModBus I.D.	Tank I.D.	Discrete Input 1
Discrete Input 2	Communications Status	Field Loop Status

Tank Activity And Movement Detection

Tank Movement	Level Active	Level Inactive
Time Active	Time Inactive	

Report Generation

Group Code Inventory	Product Code Product Summary	Product Name Tank Summary
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Advanced Diagnostics (SFI-Series Gauges)

CPU Voltage Encoder Status	CPU Temperature Field Voltage	Emitter Current Memory Status
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MCG1600SFI Diagnostics

Over forty real-time data items are available from the MCG1600SFI via WINGauge. This provides the control-room technician with a detailed view of the remote radar gauge's operation and programming.

Standard System Screens

- Active Tanks
- Alarm History
- Alarm Summary
- Field Comm Failures
- Comm Counters
- Product Code
- Editor
- Group Display
- Group Summary
- Product Summary
- IFIC Configuration
- IFIC History
- IFIC Trending
- Tank Trending
- MCG1090 Summary
- MCG1600 Diagnostics
- MCG2000 Diagnostics
- Pump Log
- Real Time
- SiteView
- Servo Gauge Controller
- Operator Console
- Strapping Table Editor
- System Configuration
- Tank Configuration
- Tank Detail
- Tank Parameters
- Tank Summary
- User Display
- Volume & Rates

MCG 3902 Tank Gauging System

Minimum Specifications:

- Rack Mount Industrial Computer
- Quad-core Intel / AMD CPU
- Eight (8) Gigabytes of RAM
- 120 Gb SSD or Hard Disk
- 24" LCD Video Display
- Keyboard and Mouse
- Microsoft Server Operating System
- WINGauge V5 Server Software

MCG 3905 Ordering Guide

MCG 3905 WINGauge Inventory Management System

Includes: Windows Based System, 4 GB RAM Minimum, 160 GB (or larger) Hard Drive, 24" LCD, Mouse, Keyboard, Gauging Software Package

Model Number Selection:

The model number will consist of a base number **MCG 39XX** followed by 10 digits. These digits will represent 5 sets of option tables:

MCG 39XX - AB - CD - EF - GH - IJ

AB - Number of Tanks	
00	1-25 Tanks
01	26 - 100 tanks
02	101 - 250 tanks

CD - Printer	
01	Print Software Only (Customer Supplied Printer)
02	Printer and Software

EF - Monitor	
00	No Monitor (Customer Supplied)
10	24" LCD

MCG 3901 SWITCHOVER

19" Rack & Field Ports

MCG 3950 Client Software

Software only, uses Ethernet Connection

G - Remote Communication	
0	No Remote Communication
1	Modbus Output Binary RTU Slave
2	TopTech
3	OPC Server
4	Dual Modbus Output Binary RTU Slave
5	Modbus Over Ethernet

H - Communication*	
0	L&J Tankway
1	Varec 4-wire
2	GPE 31423, 22 (4 Loops)
3	GPE 31423, 22 (8 Loops)
4	RS-485
5	GPE 31422
7	RS-232

*Consult Factory for additional options

IJ - Computer Options / Drives	
00	Standard PC

All designs subject to change. Certified dimensions and specifications available upon request.