

# G7 CLOUD MONITORING SYSTEM

## ARCHITECTURE OVERVIEW

SCALABLE • RELIABLE • INTELLIGENT



### 1 FIELD LAYER Data Acquisition



- G7 Wireless Sensors**
- Temperature & Humidity
  - Pressure & Level
  - Analog Sensor
  - Digital Sensor
  - RS485 Modbus

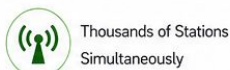


- G7 Base Station**
- Up to 64 sensors per station
  - LAN / Cellular / Internet
  - UTC Time Synchronization
  - Battery & Health Monitoring

### 2 COMMUNICATION LAYER Secure Data Transmission



TCP/IP Multi-Connection



Thousands of Stations Simultaneously



High-Speed Data Buffering



Multi-Threaded Processing (Patented)



Real-Time Command & Control

### 3 SERVER LAYER G7 Cloud Server Core



- ✓ High-Volume Data Acquisition & Processing
- ✓ Centralized Database Management (MySQL)
- ✓ Real-Time Storage, Buffering & Synchronization
- ✓ Alarm Processing & Event Management
- ✓ Statistical Analysis & Report Generation

Up to <b>99,999</b> Base Stations	Up to <b>999</b> Client Users	Thousands of Data Threads per Second	Redundant Database Support
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### 4 MANAGEMENT & CONTROL LAYER



- Device & User Management**
- Hierarchical Grouping
  - Multi-Tenant Support
  - Role-Based Access Control



- Alarm Management**
- Multi-Level Alarms
  - Configurable Rules
  - Email, SMS & On-Screen Alerts
  - Fault & Loss Detection



- System Monitoring**
- Server Load Tracking
  - Bandwidth Monitoring
  - Event Logging
  - Automatic Alerts

### 5 APPLICATION LAYER G7 Client Interface



- ✓ Live, Historical & Statistical Data
- ✓ HMI, Dashboard (up to 64 sensors)
- ✓ Line Charts & Comparison Graphs
- ✓ Meter View & Data Listing
- ✓ Remote Configuration (Admin)
- ✓ Instant Alarm Notifications (On-Screen, Email, SMS)
- ✓ Data Export: SQLite, MDB, CSV
- ✓ Multi-User Simultaneous Access

#### SYSTEM WORKFLOW



**1. SENSORS → BASE STATIONS**  
Wireless sensors collect and transmit field data



**2. BASE STATIONS → G7 SERVER**  
Data is securely transmitted via LAN / Internet



**3. G7 SERVER PROCESSING**  
Data is stored, analyzed and monitored in real time



**4. CLIENTS ACCESS DATA**  
Users visualize, analyze and receive alerts across devices

## Overview

- **Scalable IoT Platform** – From small deployments to enterprise-level systems
- **High Reliability** – Redundant database and fault-tolerant architecture
- **Real-Time Intelligence** – Instant data processing and alarm notification
- **Flexible Deployment** – Cloud, in-premise, or hybrid configurations
- **Multi-User & Multi-Site Management** – Ideal for industrial, utility, and environmental monitoring
- **Comprehensive Analytics** – Integrated reporting, statistics, and visualization tools

## System Capabilities

- Supports MySQL databases with redundant database architecture
- Capable of processing thousands of concurrent data threads (patented technology)
- Role-based access control with Administrator and Standard User levels
- Remote server configuration and system management
- Automatic base station clock synchronization
- Flexible group-based management for users, base stations, and alarms

# G7 Server Client Software

Scalable IoT cloud server solution

## Key Features

- ❖ Centralized database management
- ❖ Comprehensive management of base stations, sensors, client users and alarms
- ❖ Advanced handling of real-time data, statistical analytics and alarm events

## Client & User Management

- max. 99,999 base stations
- max. 999 remote clients
- 99 groups per hosting instance
- Multi-tenant cloud architecture
- Role-based access & authentication

The screenshot shows a software interface with three tabs: 'Live Data', 'History Data', and 'Statistical Data'. On the left, there is a 'Query Setting' panel with a 'Query Station ID' filter set to 'ALL', 'Display Selection' options for 'Normal Data' (checked) and 'Alarm Data', and an 'Automatic Refresh Interval' field. The main area displays a table with the following data:

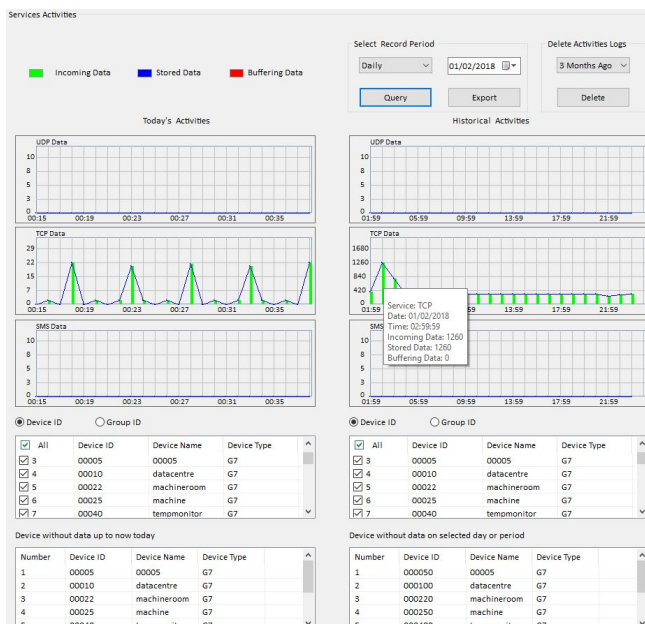
NO.	Client Code	Header	Station ID	Station Name	Record_Time
1	ZZZ-WZJ-ZIZ-AZY	STA	11111	DataCentre	2018-02-01 23:36:00
2	ZZZ-WZJ-ZIZ-AZY	STA	22222	22222	2018-02-01 23:34:00
3	ZZZ-WZJ-ZIZ-AZY	STA	11111	DataCentre	2018-02-01 23:34:00
4	ZZZ-WZJ-ZIZ-AZY	STA	00119	00119	2018-02-01 23:33:20
5	ZZZ-WZJ-ZIZ-AZY	STA	00118	00118	2018-02-01 23:33:20
6	ZZZ-WZJ-ZIZ-AZY	STA	00117	00117	2018-02-01 23:33:20
7	ZZZ-WZJ-ZIZ-AZY	STA	00116	00116	2018-02-01 23:33:20
8	ZZZ-WZJ-ZIZ-AZY	STA	00115	00115	2018-02-01 23:33:20
9	ZZZ-WZJ-ZIZ-AZY	STA	00114	00114	2018-02-01 23:33:20
10	ZZZ-WZJ-ZIZ-AZY	STA	00113	00113	2018-02-01 23:33:20

## Alarm & Notification System

- ❖ Multi-level high/low alarms per sensor
- ❖ Notifications by on-screen alert, SMS, email
- ❖ Detection of sensor fault and system failure
- ❖ Configurable alarm delay and interval

The screenshot shows the 'Alarm Alert Setup' configuration panel. It includes fields for 'Station ID' (11111), 'Station Name' (DataCentre), 'Display Alert Interval' (01m), 'E-mail Alert Interval' (01h), and 'Phone Alert Interval' (01h). Below the configuration is a table with columns for 'Station ID', 'Station Name', 'Enable Display Alert', 'Enable Email Alert', and 'Enable Phone Alert'. The table lists 14 stations with their respective names and alert enablement status (indicated by blue circles).

Station ID	Station Name	Enable Display Alert	Enable Email Alert	Enable Phone Alert
00005	00005	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00010	datacentre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00022	machineroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00025	machine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00040	tempmonitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00100	00100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00101	00101	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00102	00102	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00103	00103	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00104	00104	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00105	00105	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00106	00106	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00107	00107	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00108	00108	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00109	00109	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00110	00110	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00111	00111	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00112	00112	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00113	00113	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
00114	00114	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

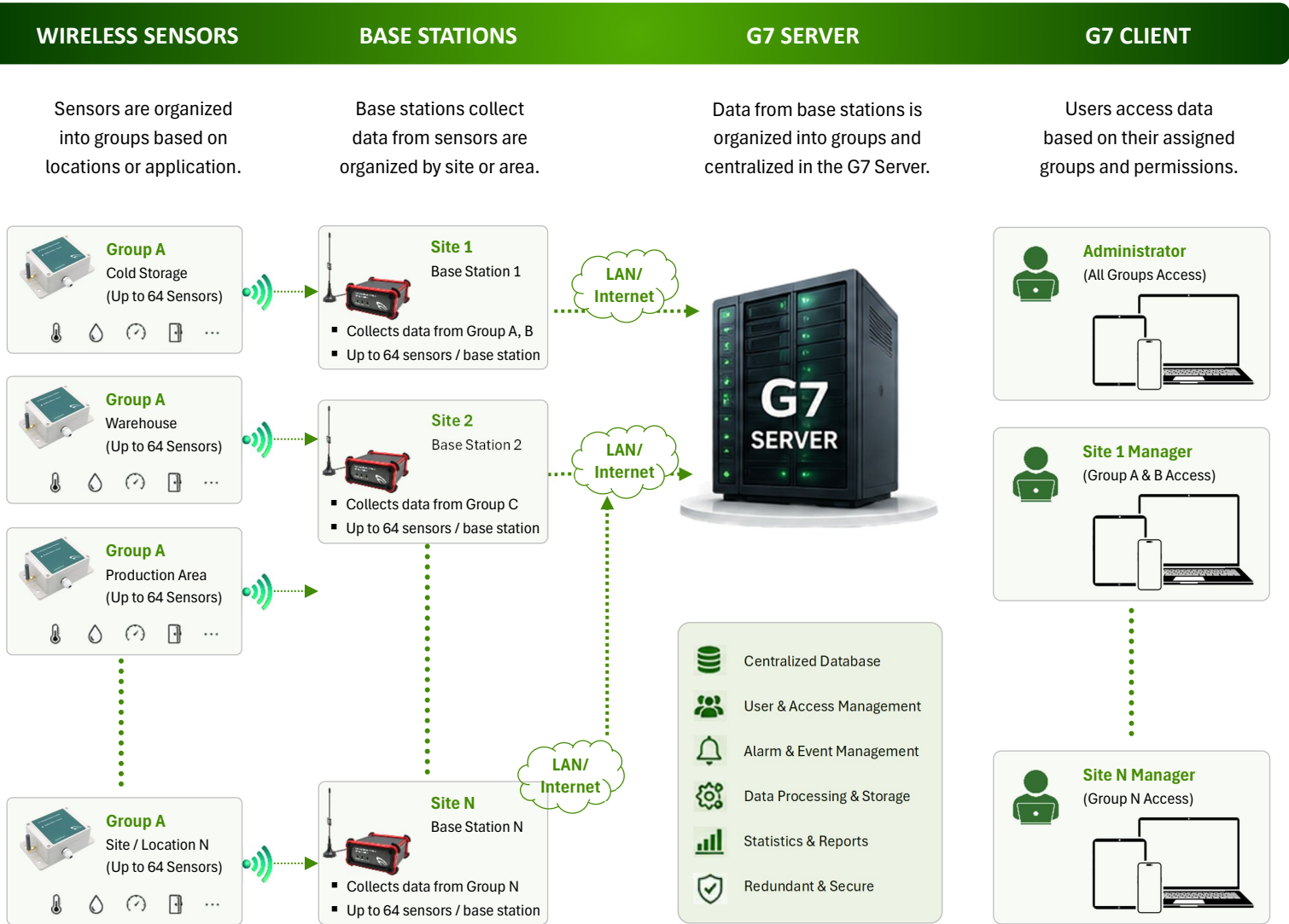


## System Performance & Reliability

- ❖ Multi-threaded architecture handling thousands of records per second
- ❖ Real-time server load and performance tracking
- ❖ Data throughput and bandwidth monitoring
- ❖ Event logging for diagnostics and auditing
- ❖ Automatic alerts for abnormal system conditions
- ❖ Redundant database architecture for fail-safe operation

# G7 Server Client Software

Scalable IoT cloud server solution



**G7 Server Software** is a high-capacity IoT platform designed for G7 wireless sensors to act as the central hub for large-scale wireless monitoring. It bridges the gap between field sensors and end-users, providing a robust backbone for industries like agriculture, cold chain logistics, and industrial automation.

## Common Applications

- **Agriculture:** Monitor environmental conditions over long ranges (up to 1200m) without expensive cabling.
- **Storage & Logistics:** Real-time tracking of diesel levels in gas tanks and temperature stability in food storage.
- **Smart Factories:** Centralized monitoring of industrial transducers and air pressure to prevent equipment failure.

# G7 Server Client Software


Scalable IoT cloud server solution

## ADVANCED FUNCTIONAL MODULES

### 1. Tank Volume Calculation

- ❖ Various tank geometry formula built-in
- ❖ Calculating the tank volume based on level measurement.
- ❖ Selectable measurement unit in liter, gallon or cm<sup>3</sup>
- ❖ Support different type level sensors and 2 levels of high/low alarm

- Multiple Tank Geometries (Vertical, Horizontal, Rectangular)
- Ultrasonic & Pressure Level Support
- Real-Time Volume & Percentage Display
- High/Low Volume Alarms & Notifications
- Data Export for Reporting & Analysis




**G7 Wireless Sensor (Level, Pressure)**


#### TANK VOLUME CALCULATION

Accurate real-time tank volume measurement and calculation for a wide range of tank types.


#### SUPPORTED TANK GEOMETRIES



Vertical Tank



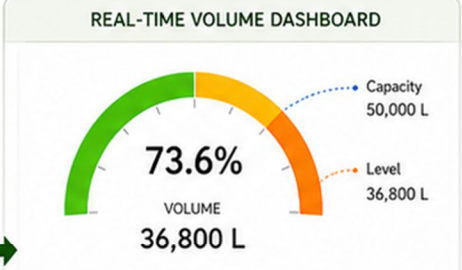
Horizontal Tank



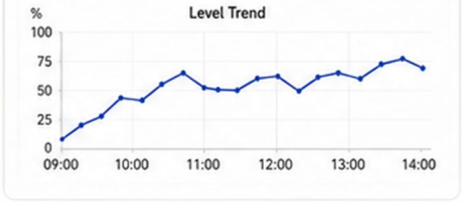
Custom Tank

- ✔ Compatible with Ultrasonic & Pressure Level Sensors
- ✔ Real-Time Volume Computation & Percentage Level
- ✔ High / Low Volume Alarms with Customizable Thresholds
- ✔ Easy Configuration for Different Tank Types

#### REAL-TIME VOLUME DASHBOARD



Capacity 50,000 L  
Level 36,800 L  
73.6%  
VOLUME 36,800 L



Level Trend


### 2. Flow Rate & Flow Volume Calculation

- ❖ Flow Rate works on pulse reading or flow volume
- ❖ Multi-levels alarm settings
- ❖ Notifications by on-screen alert, SMS and email
- ❖ G7 Client displays flow rate, total volume and alarm

- Pulse or Modbus Flow Calculation
- Time-Base Aggregation (Hourly, Daily, Monthly)
- Historical Data Storage & Export
- Flow Alarms with Notifications
- Integrated Reporting & Data Analysis

#### ANALYTICS SUMMARY

- Instant Flow Rate 25.36 m<sup>3</sup>/h
- Today's Total Volume 256.80 m<sup>3</sup>
- Monthly Total Volume 7,458.60 m<sup>3</sup>
- Average Flow Rate 18.42 m<sup>3</sup>/h
- Maximum Flow Rate 48.75 m<sup>3</sup>/h




**Flow Meter (Pulse / Modbus) + G7 Wireless Sensor**

#### FLOW RATE & VOLUME ANALYTICS


Comprehensive flow measurement, aggregation and analytics for process monitoring.

- ✔ Flow Calculation from Pulse or Modbus Data
- ✔ Time-Based Aggregation: Hourly, Daily, Monthly
- ✔ Historical Data Storage & Export
- ✔ Flow Alarms with Thresholds & Notifications
- ✔ Compatible with Various Flow Meters & Sensors

#### FLOW RATE & VOLUME DASHBOARD



Flow Rate (m<sup>3</sup>/h)



Total Volume (m<sup>3</sup>)

# G7 Server Client Software

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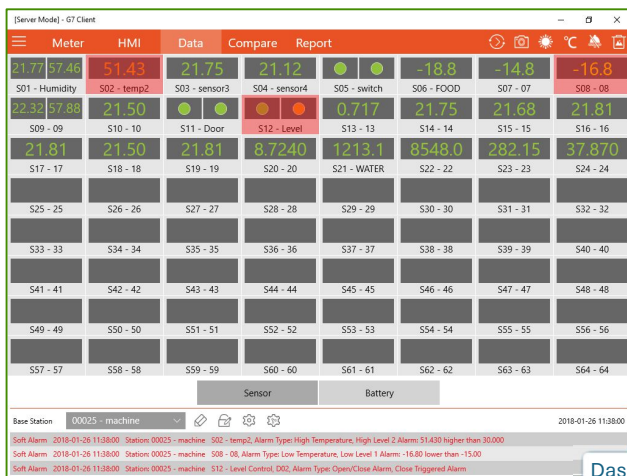
## G7 Client Software

- Windows 11, iOS and Android
- Multi-screen visualization
- Real-time alerts and notifications
- Allow user customization

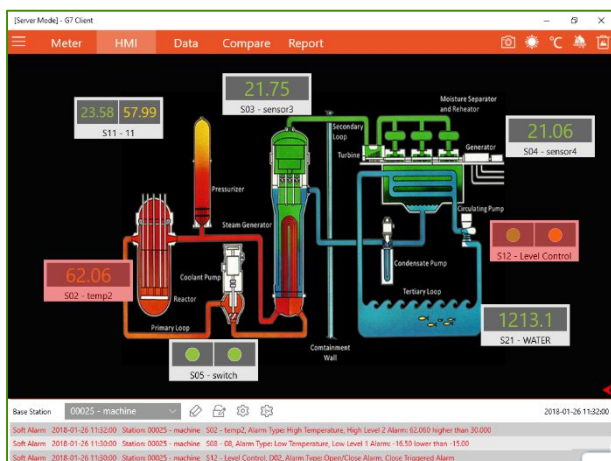
- \* **Dynamic View Options:** Switch between Meter View, HMI, Dashboard, and Line Charts to visualize data.
- \* **Multi-Sensor Monitoring:** View up to 64 sensors simultaneously on a single dashboard, and monitor hundreds more in the background.
- \* **Instant Critical Alerts:** Receive on-screen notifications, audio buzzers, and emails for alarms.
- \* **Comprehensive Data Exports:** Effortlessly export data in CSV or SQLite formats for third-party software.
- \* **Remote Configuration:** Administrators can remotely adjust alarm settings and parameters directly from the client interface.



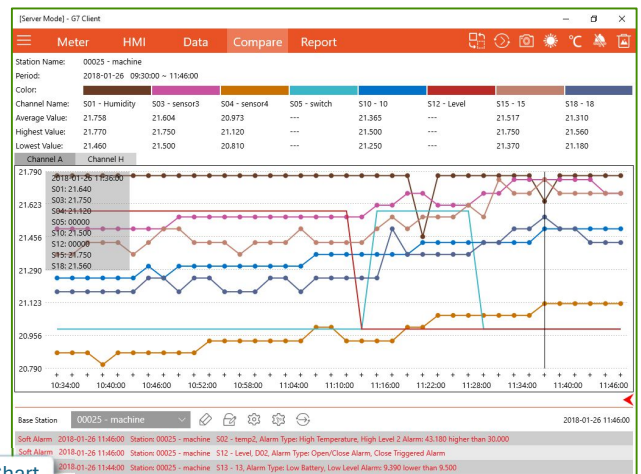
Meter



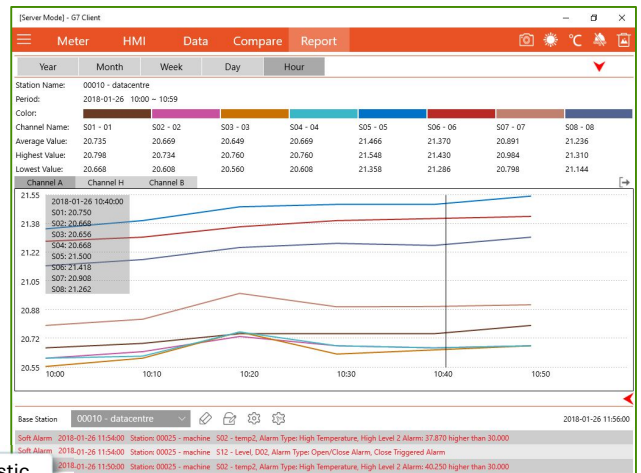
Dashboard



HMI



Line Chart



Statistic