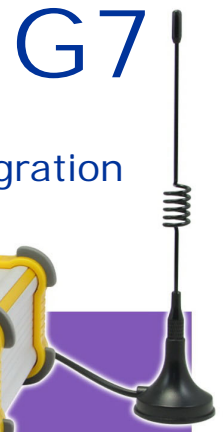# Smart Wireless Sensor

G7

G7 creates the **IoT** platform of sensor data exchange and integration

64 wireless sensors each station

* temperature, humidity, analog sensors, digital alarm

* Modbus RS485, onboard relay switch

Windows / iOS / Android Monitoring App

Up to 5 years battery operation or solar power

1200 meter wireless distance

System Integration

▸ TCP Modbus support for BMS integration
▸ API dll for third party software programming
▸ REST API for user web portal development

Support

4-20mA, 0-5V sensor
Modbus RS485

Wireless Sensor

* temperature & humidity
* analog sensor 4-20mA, 0-5V
* digital alarm, Modbus RS485
* average 2~3 year battery life
* transmission interval (5s ~ 4hrs)

Free App

Easy to use G7 Client Apps
* Client for Win 10, iOS & Android
* Data Receiving Centre Software
* Setup Software
* Support TCP Modbus

Professional

Sensor high/low alarm levels
Battery Low Alert
Alert user over LAN or Internet
Email Alarm by G7 Client
Alarm Triggered Relay Switch

G7 makes factory, storage and farming smarter by the power of IoT.

Agriculture & Farming

Recording and analysis of temperature, humidity situation in greenhouse or farm where cabling is difficult or impossible.

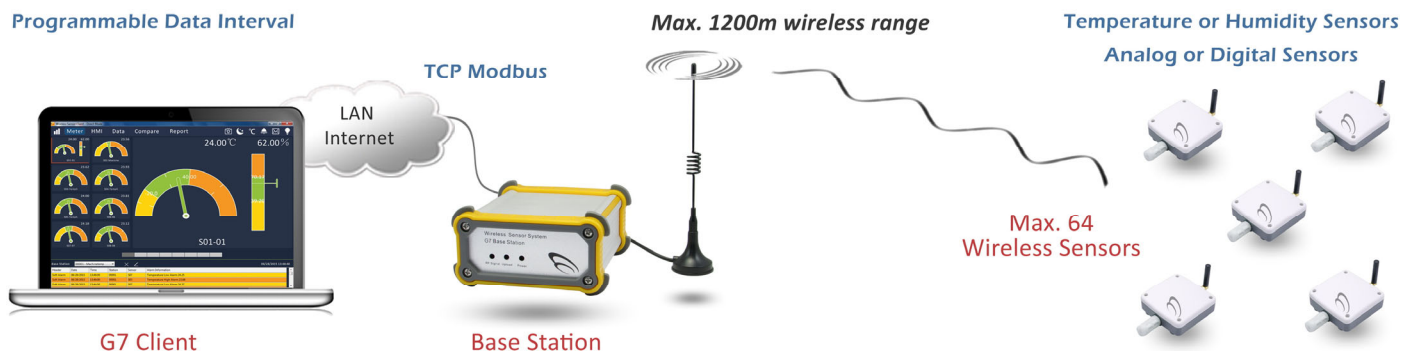Long distance 1.2km is ideal in agriculture.

Tank & Cold Storage

Diesel Level & Temperature Monitoring are critical in gas tanks and cold food storage.

Alert user wirelessly when oil level or temperature is high/low.

Pharmacy Automation

Keep recording of temperature and humidity for audit and analysis.

Hassle free installation without cabling. Instant alarm on temperature.

ED-2505-01

How user receives the sensor data?

Programmable Data Interval

TCP Modbus

LAN Internet

Max. 1200m wireless range

Temperature or Humidity Sensors
Analog or Digital Sensors

24.00℃   62.00%

S01-01

Max. 64 Wireless Sensors

G7 Client

Base Station

G7 Wireless Sensor sends real time data wirelessly through radio wave to the Base Station.

Base Station collects the measurement of all wireless sensors, and uploads to central computer.

Both station and sensor are easily configured by setup software via USB port.

Wireless Sensor

Temperature Sensor (G7-T2)	
Temperature:	-55 ~ 125 °C (+/- 0.5°C)
Combo Sensor (G7-H2 / H3)	
Temperature:	-40 ~ 125 °C (+/- 0.3°C)
Humidity:	0 ~ 100%RH (+/- 2%)
Analog Sensor (G7-AD)	4-20mA / 0-5VDC input
Digital Alarm (G7-D2)	On/Off Dry Contact
Modbus (G7-MB)	RS485
Optional: (G7-R)	Onboard Relay
Upload Interval:	5s ~ 4 hours
Wireless Distance:	1200 meter (unblock)
Sensor ID:	User programmable 5 digits
RF Wireless:	433/868/915MHz
RF Power:	< 20dBm
Operation Rating:	80mA (data transmission)
Standby Rating:	~3.0uA (sleep mode)
Operating Voltage:	2.5~3.6V DC
Battery:	3400mAh
Battery Life:	~ 3 year (1hr upload)
Extended Battery:	14000mAh
Battery Life:	~ 10 year (1hr upload)
Dimension:	80 x 80 x 28 mm
Operating Temperature:	-20 ~ 75 °C

EMC Compliance:	EN300220, EN301489, EN60950
Certificate:	FCC, RoHS

Base Station

Upload Interval:	5s ~ 4 hours
Protocol:	TCP/IP Network
	TCP Modbus support
Network Port:	10/100M Ethernet
	Fixed & Dynamic IP
Upload Central Server:	Fixed IP & DDNS
Industrial Support:	Modbus TCP protocol
Internal Memory (G7-BS+):	4MB (~30000 records)
RF Wireless:	433MHz, 4.8Kbit/s
RF Address/Band:	255/15
Operating Voltage:	5V DC
Rating:	< 1A
Operating Temperature:	-15 ~ 75 °C
Dimension:	110 x 95 x 45 mm

Base Station
G7-BS
G7-BS+ (4MB)

◆ Receive Wireless Data from sensors

◆ Upload data via LAN/Internet to central

G7 Client Lite for Windows (Desktop & Touchscreen), iPad, iPhone & Android Phone

Receives data from Base Station over LAN or Internet

Displays both live, historical and statistical data in graphics

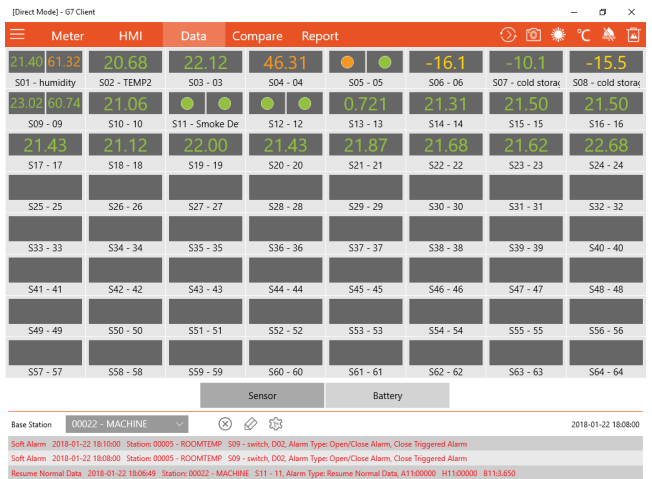Data records are saved into local storage for comparison or report generation

Data can be exported as csv or SQLite for third party software data analysis

Dashboard display mode gives an overview of 64 sensors reading on one single screen
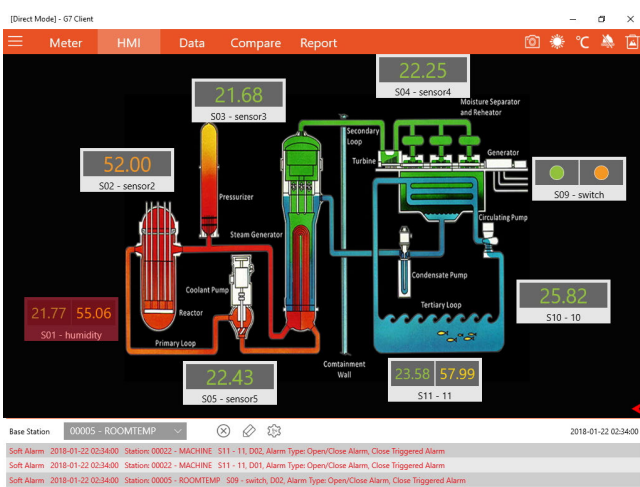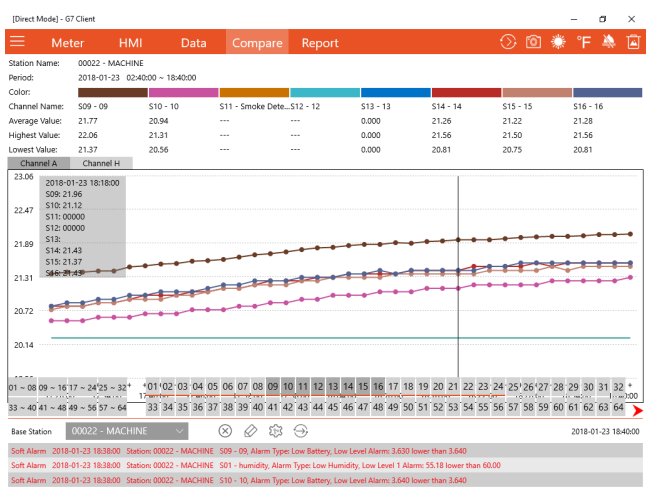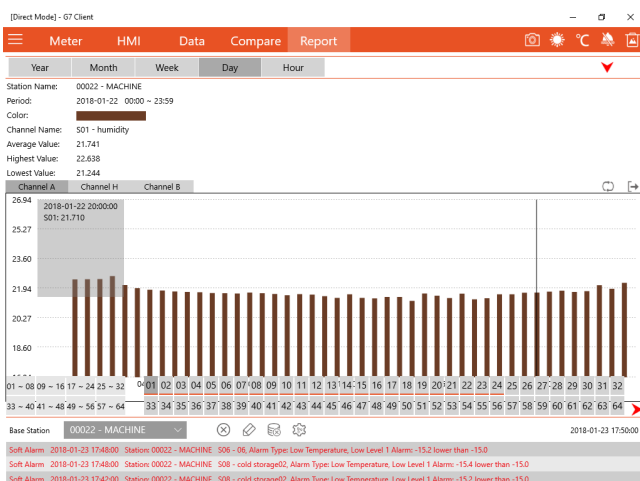
Meter

Dashboard

HMI

Line Chart

Statistic Report

Alarm

On Screen Alert

User is alerted when high/low temperature, humidity, analog level, digital alarm or low battery voltage is triggered.

Alarm Email

G7 Client for Win10 sends alarm up to 3 email addresses.

Wireless Temperature Sensor (-55 ~ 125 ℃)

Specification

Range:	-55 ~ 125 °C
Accuracy:	+/- 0.5 °C
Steel Probe:	50mm or 100mm
	water submersible
Cable:	2m or customized length
PVC Case:	waterproof

G7-T2
♦ Temperature Probe, 2m cable

Standard Battery

Battery Capacity:	3.6V, 3400mAh
Battery Life:	> 3 years (upload: 30 min)
Dimension:	80 x 80 x 28 mm

G7-TX
♦ Temperature Probe with 100mm steel housing

G7-DT
♦ 2 x Temperature Probe

Extended Battery

Battery Capacity:	3.6V, 14000mAh
Battery Life:	> 10 years (upload: 30 min)
Dimension:	115 x 90 x 55 mm

Longer Operation Time

G7-T2Ex
♦ Temperature Probe with 50mm steel housing
♦ 2m cable
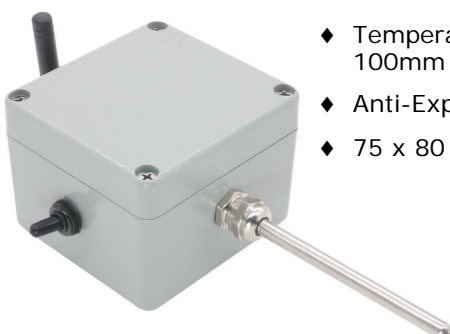
G7-TXEx
♦ Temperature Probe with 100mm steel housing

Specific Application

Oil / Diesel Temperature Monitoring
Anti-corrosive
Anti-explosive

Harsh Operation Environment

G7-T2C
♦ Temperature Probe with 50mm steel anti-corrosive housing (oil/diesel submersible)

G7-ATX
♦ Temperature Probe with 100mm steel housing
♦ Anti-Explosive metal case
♦ 75 x 80 x 43 mm

♦ Anti-corrosive cable, 2m (oil/diesel submersible)

Wireless Temperature Humidity Sensor (-40 ~ 125 °C, 0 ~ 100%RH)

Specification

Temperature:	-40 ~ 125 °C, +/-0.3 °C
Humidity:	0 ~ 100%RH, +/- 2%
Probe:	water resistant
Cable:	1m or customized length
PVC Case:	waterproof

G7-H3

♦ Temperature & Humidity Sensor, waterproof probe

Standard Battery

Battery Capacity:	3.6V, 3400mAh
Battery Life:	> 3 years (upload: 30 min)
Dimension:	80 x 80 x 28 mm

G7-H2

♦ Temperature & Humidity Sensor, 1m cable

G7-S2 / H4 / H5 /H6

♦ Water resistant probe
♦ 1m cable
♦ Outdoor application

Extended Battery

Battery Capacity:	3.6V, 14000mAh
Battery Life:	> 10 years (upload: 30 min)
Dimension:	115 x 90 x 55 mm

G7-H3Ex

♦ Temperature & Humidity Sensor, waterproof probe

G7-S2 / H4 / H5 /H6

G7-H2Ex ♦ Temperature & Humidity Sensor, 1m cable

Wireless Sensor - onboard relay

Relay Output:	30VAC/1A, 350VAC/0.12A
State:	Normal Open
Alarm Triggered:	Relay Output Close
Relay Time Lapse:	0 ~ 255 s

Wireless Sensor (onboard relay)

* G7-T2-R   Wireless Temperature Sensor
* G7-H2-R   Wireless Temperature Humidity Sensor

Siren

Pump

Operation Flow

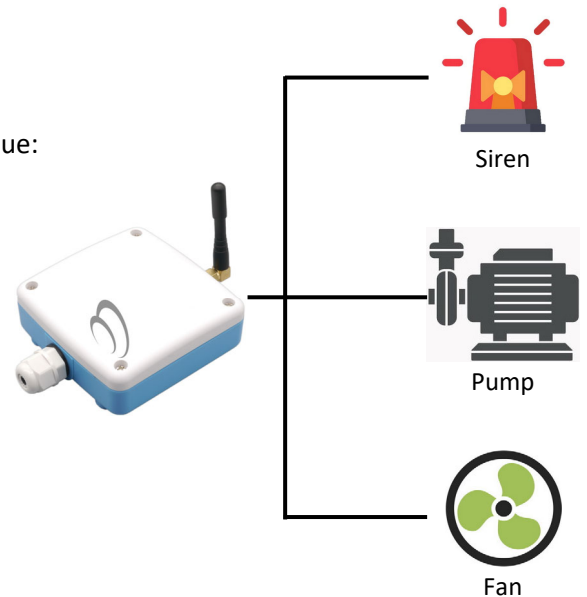When temperature or humidity is higher/lower than preset value:

1. Wireless Sensor sends alarm data to base station
2. Base Station sends alarm to central server
3. Wireless Sensor turn on the onboard relay

Wireless Sensor (onboard relay)

* *Relay Switch is integrated in Wireless Sensor*
* *Relay is triggered on by alarm.*
* *Alarm can be temperature or humidity .*

Fan

Application Example

No Cabling, Simple Installation

Sensors High & Low Level Alarm

Siren is turn on when temperature or humidity is higher or lower than preset values (G7-H2-R)

Other equipment e.g. fan can be turn on when temperature is high (G7-T2-R)

Base Station receives alarm at the same time

User will be alerted by G7 Client remotely

wireless distance ~1200m

G7 Client   Base Station   Siren Control   Fan Control

Max. 64 Wireless Sensors (with or withour Relay)

Industrial **High Precision** Wireless Temperature & Humidity Sensor

Digital Sensor:	AM2315C
Temperature:	-40 ~ 80 °C (+/- 0.3 °C)
Humidity:	0 ~ 100%RH (+/- 2%RH)
Signal:	Digital I2C
Probe:	1m extended cable
Battery Capacity:	3.6V, 3400mAh (G7-HA)
Battery Capacity:	3.6V, 14000mAh (G7-HAEx)

G7-HA

G7-HAEx

Wireless Sensor - Analog Sensors

Analog Sensor:	4-20mA or 0-5VDC signal input
Battery:	3.6V, 14000mAh
Operation Period:	> 5 years (upload: 30 min)
Internal Power Output:	12 or 24VDC for sensor
	with max. 40mA rating

▶ High Capacity 3.6V battery (14000mAh)
▶ Operation Period ~ 5 years (excluding sensor)

Battery Option (G7-AD)

G7-AD Wireless Analog Sensor supports analog sensors with 4-20mA or 0-5VDC input.

Low Power Design
Micro-controller supports sleep mode for years long operation in battery.

Internal Power Output
It provides on board voltage output 12VDC for external analog sensors in different applications e.g. soil humidity sensor for agriculture.

Warm Up Time
Stabilize external analog sensors reading before capturing data.

Wireless Level Sensor

Wireless Soil Temperature Humidity Sensor

Wireless pt100 Temperature Sensor (food safety)

Wireless Sensors for Agriculture

Wireless Soil Moisture Sensor
Wireless Soil EC Sensor
Wireless Soil pH Sensor

Soil Moisture Probe

Range:	0 ~ 100%
Accuracy:	+/- 3%
Measuring Area:	90%
Response Time:	<1s
Diameter/ Height:	3cm / 6cm
Material:	anti-corrosive ABS PVC
Probe:	FDR measuring technology
	Stainless Steel IP68 Housing

Soil pH Probe		Soil EC Probe	
Range:	3~9 pH	0 ~ 10000uS/cm	
Accuracy:	+/- 0.3pH	+/- 10uS/cm	

Light Sensor

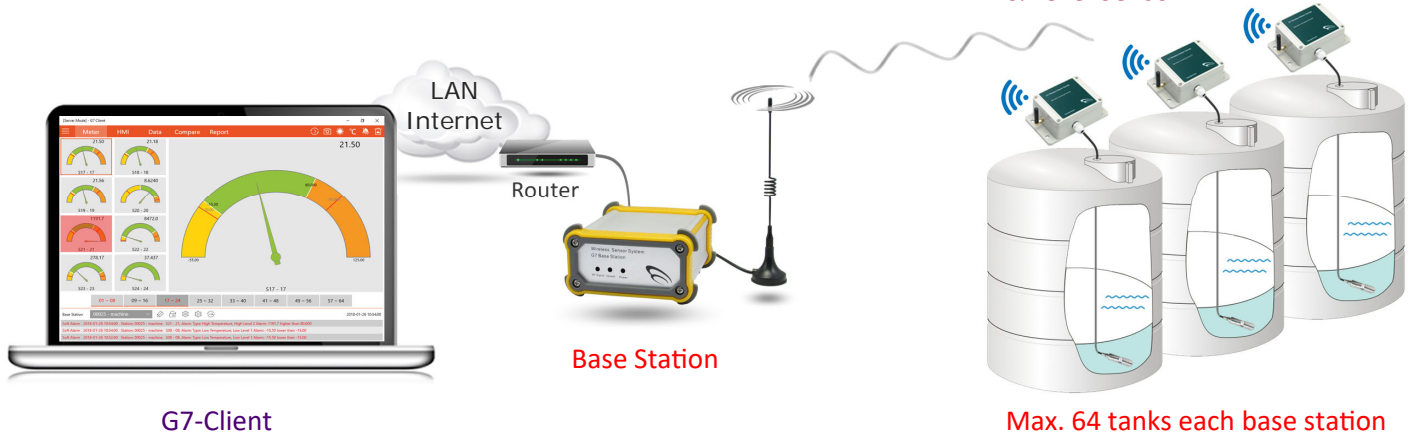|	
Measuring Range:	0 ~ 200K lux
Spectral Range:	400 ~ 700nm
Accuracy:	+/- 5%
Operating Voltage:	12-24VDC
Output:	4~20mA
Enclosure:	PVC IP65 Water Proof Housing
Application:	Farming, Agriculture, Greenhouse

Wireless Oil Tank Level Tracking

Real Time Tank Level Tracking

High & Low Level Alarm

No Cabling, Simple Installation

Free Software - real time level or volume monitoring

G7-AD Wireless Analog Transmitter & Level Sensor

LAN Internet

Router

Base Station

G7-Client

Max. 64 tanks each base station

Application:

Gas Refueling System - measuring the level or volume

Oil Tanks - real time monitoring of level or volume

Mobile Oil or Gas Tanks - no cable connection is needed from mobile tanks to volume tracking system

Multiple Tanks Monitoring System - one single software is capable of volume tracking > 500 tanks
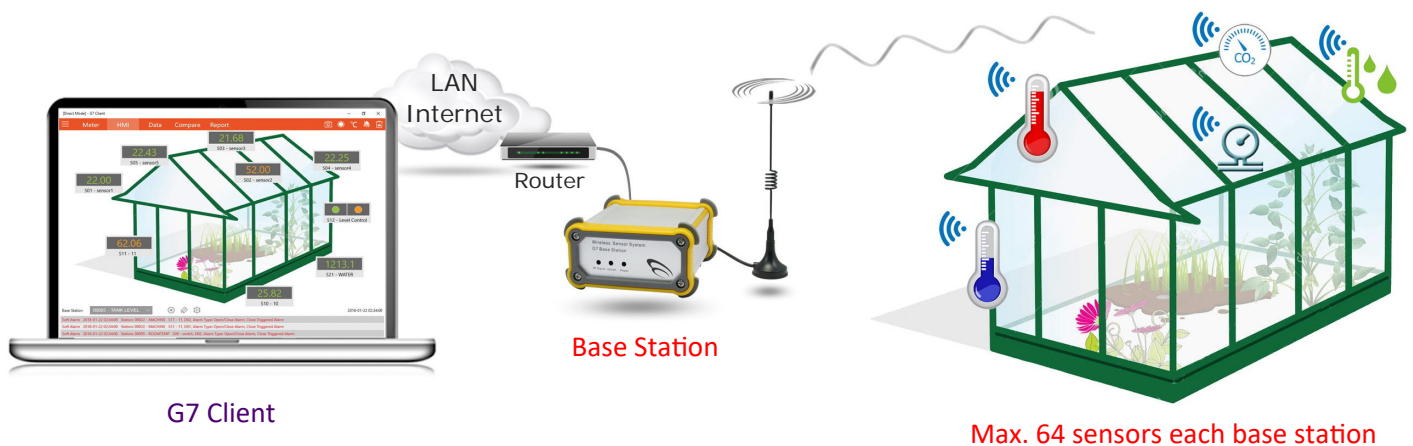
Wireless Greenhouse Environmental Monitoring

Sensors High & Low Level Alarm

No Cabling, Simple Installation

Free Alarm Software - monitoring 128 sensors

Turn on fan when temperature is high (G7-T2-R)

G7-AD Wireless Analog Sensor (CO2, Pressure, PM2.0)

G7-H2 Wireless Temperature & Humidity Sensor

G7-D2 Wireless Digital Alarm (Door Contact, Water Leak)

LAN Internet

Router

Base Station

G7 Client

Max. 64 sensors each base station

Application:

Greenhouse - no cabling cost, real time tracking of temperature, humidity, CO2, other sensors

Farming - no cabling, easy installation up to 1200m wireless distance

Factory - support industrial sensors e.g. pt100 analog sensor for extreme range

Weight - wireless load cell or weight scale measurement for truck, poultry and storage tanks

G7-D2 Wireless Digital Alarm

supports 2 channels of digital alarm inputs

It is widely used in remote alarm of oil tank level switch or cold food fridge door open.

G7-D2
3.6V 3400mAh Battery

Level Switch

Smoke Detector

G7-D2Ex
3.6V 14000mAh Battery

Vibration Detector

Low Power Design
Micro-controller supports sleep mode for 3-5 years long operation in battery.

Instant Alarm
It provides instant alarm even in sleep mode.
- Programmable repeated alarm interval
- Programmable number of repeated alarms
- Low battery alarm

Digital Input Status
Keep track of input status in interval
Alert user when alarm triggers or resumes normal
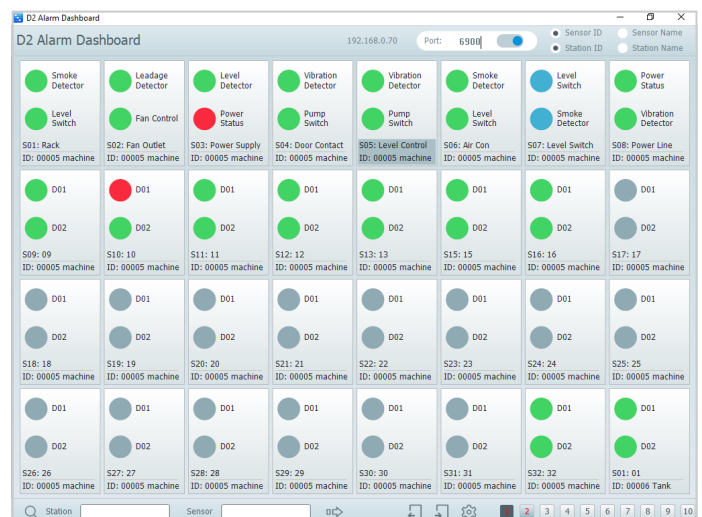
LAN/Internet Connection
Base Station sends alarm over LAN/Internet instantly
Both fixed IP and DDNS are supported
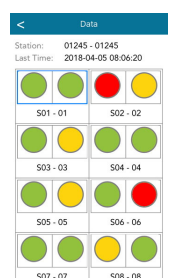Support TCP Modbus for BMS integration

Simple Installation
- No cabling for wireless transmitter
- 2 wire connection with detector

Optional Onboard Relay
G7-D2-R turns on devices e.g. fan or siren triggered by alarm.

Digital Alarm Detector
Support any alarm detector with on/off dry contact output

Free Digital Alarm Monitoring Software

- Real Time Alert on alarm & resume normal
- Monitoring max. 320 alarm sensors
- Max. 100 base stations
- Each sensor supports max. 2 alarm inputs
- Sensor battery low level alert
- Audio & Display alerts, Email & SMS Alarm
- Email Alarm sent to max. 5 users mailbox
- SMS Alarm sent to max. 5 users mobile phone
- Digital Alarm On, Off, Resume status in different alert colors
- Alert on wireless sensor communication loss
- Base Station and Sensor Name are user programmable
- Auto fill search base station or sensor ID and name

D2 Alarm Dashboard

- Windows 10
- iPad, iPhone
- Android Phone

Wireless Oil Tank Level Alarm Monitoring

Instant High & Low Level Alarm

No Cabling, Simple Installation

Low Equipment Cost

Free Alarm Software - real time level monitoring

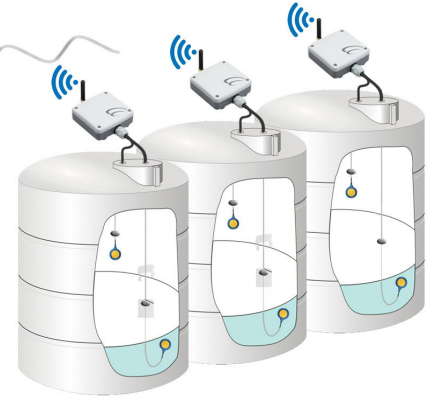G7-D2 Wireless Alarm Transmitter
& High Low Level Switch

G7-D2 Dashboard

LAN Internet

Router

Base Station

Max. 56 tanks each base station

Application:

Gas Refueling System - eliminating overflow or under refuel problem

Oil Tanks - real time alert on below or above normal levels

Mobile Oil or Gas Tanks - no cable connection is needed from mobile tanks to monitoring system

Multiple Tanks Monitoring System - one single software is capable of monitoring > 500 tanks

Wireless Water Leakage Alarm System

Instant Water Leak Alarm

No Cabling, Simple Installation

Free Alarm Software - real time water leak alarm

Turn on pump or siren when leak is detected (G7-D2-R)

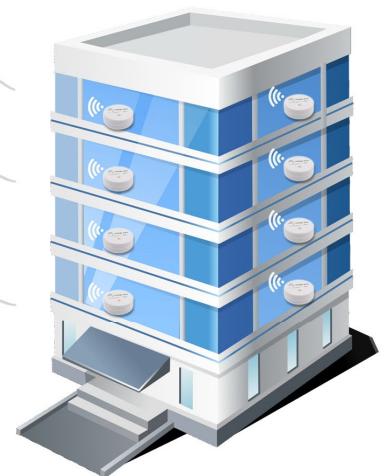G7-LK Wireless Water Leakage Sensor

G7-D2 Dashboard

LAN Internet

Max. 100 Base Stations

Max. 500 wireless water leakage sensors

Application:

Hotels   - no cabling cost, real time monitoring of water leak in max. 500 rooms

Hospital   - no cable installation, minimize loss of medical equipment or material in water leak

Factory   - wireless sensor can be installed anywhere e.g. production line, package or storage

Warehouse   - complete environmental monitoring together with wireless temperature & humidity sensors

Wireless Sensor - Modbus RS485

RS845 Port:	Modbus Protocol
Battery:	3.6V, 14000mAh
Operation Period:	> 5 years (upload: 30 min)
Internal Power Output:	12VDC for Modbus Meter with max. 40mA rating

Internal Power Output
It provides on-board power output 12VDC for external sensor or meter in different applications e.g. flow meter.

Warm Up Time
Stabilize external sensors reading before capturing data.

Low Power Design
Microcontroller supports sleep mode for battery operation.

Programmable
Modbus Data Type & Registers Address

Wireless Modbus Flow Meter

G7-MB Wireless Modbus Sensor
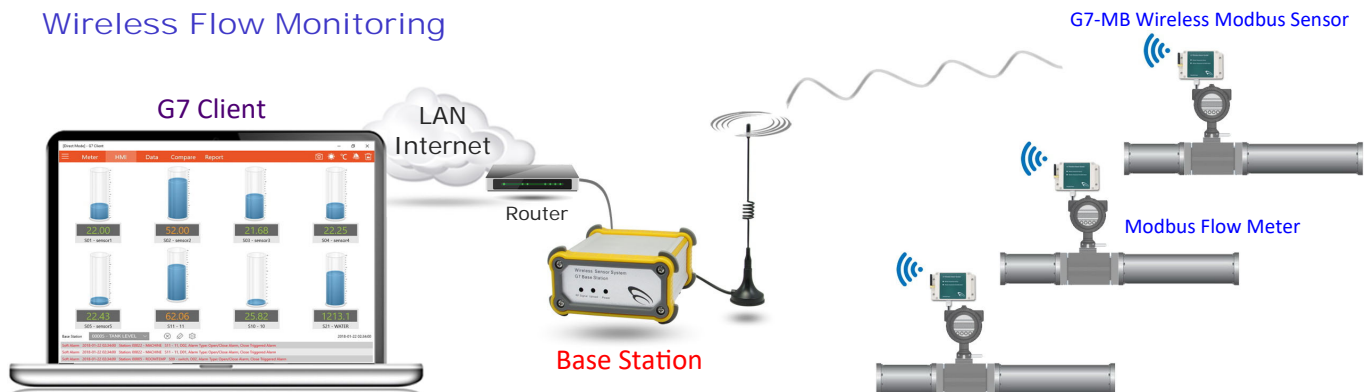
Modbus Data Registers (Address Programmable)

1 x Floating Point Modbus Data Register
   ☑ *instant flow rate*

1 x Integer Modbus Data Register
   ☑ *total flow volume*

Wireless Flow Monitoring

G7-MB Wireless Modbus Sensor

G7 Client

LAN Internet

Router

Base Station

Modbus Flow Meter

Wireless Modbus Soil Sensor

Solar Power
Wireless Modbus Soil Sensor

G7-MS Wireless Modbus Sensor

Modbus Data Registers

2 x Floating Point Modbus Data Register
   ☑ *soil temperature & moisture*
   ☑ *soil EC & moisture*
   ☑ *soil EC & pH*
   ☑ *water level & temperature*

Wireless Modbus Level & Temperature Sensor

Wireless Sensor - Solar Powered

Integrated Solar Panel:	1W (200mA 5V)
Li Rechargeable Battery:	3400mA 18650
Onboard Circuit:	Overcharge Protection

Non-Stop Operation
Low Maintenance Fee
No need to change battery
Perfect for outdoor site

1W Solar Panel

Power Options for all wireless sensors

1. Standard - 3400mA non-rechargeable low leakage battery
   (e.g. G7-T2, G7-H2)

2. Extended - 14000mA non-rechargeable low leakage battery
   (e.g. G7-T2Ex, G7-H2Ex, G7-AD, G7-MB)

3. Solar Power - 1W solar panel, 3400mA rechargeable battery, onboard overcharge protection
   (e.g. G7-T2SP, G7-H2SP, G7-ADSP, G7-MBSP)

4. Solar Power - 6W external solar panel, 6000mA rechargeable battery, onboard overcharge protection
   (e.g. G7-ADXP, G7-MSXP)

Solar Power Wireless Sensors for Agriculture

Wireless Soil Moisture Sensor
Wireless Soil EC Sensor
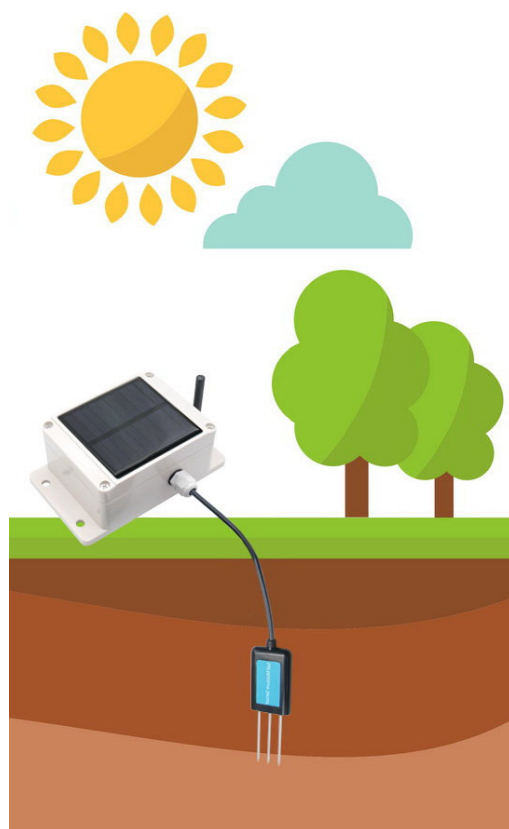**Wireless Soil pH Sensor**

G7-ADSP-SH

Soil Moisture Probe

Range:	0 ~ 100%
Accuracy:	+/- 3%
Measuring Area:	90%
Response Time:	<1s
Diameter/ Height:	3cm / 6cm
Material:	anti-corrosive ABS PVC
Probe:	FDR measuring technology
	Stainless Steel IP68 Housing

Soil pH Probe

Range:	3~9 pH
Accuracy:	+/- 0.3pH

Soil EC Probe

0 ~ 10000uS/cm
+/- 10uS/cm

External Solar Panel

Solar Power Wireless Level Sensor

G7-ADSP-LS

How G7 Client works?
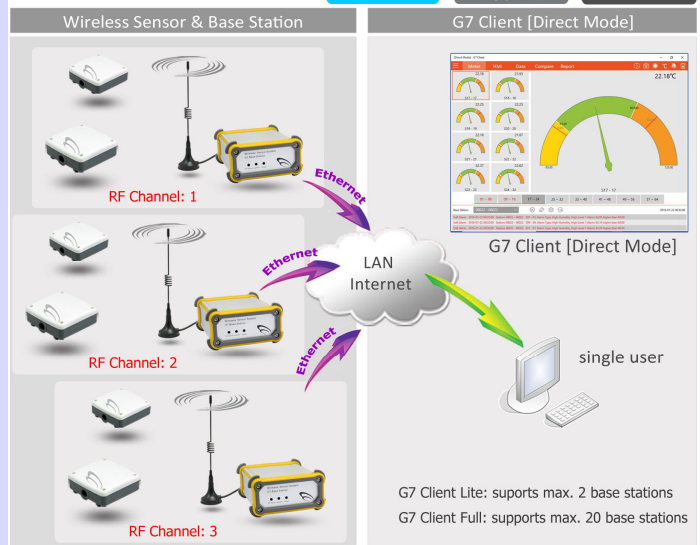
<Direct Mode - free>

- Each base station receives data from max. 64 wireless sensors
- Each base station uploads sensors to one single client user
- G7 Client Lite [Direct Mode]
  - * Each single client user accesses max. 2 base stations
- G7 Client Licensed [Direct Mode]
  - * Each single client user accesses max. 20 base stations
- Local storage of incoming data from base stations
- Graphic display of both live and historical data

Alarm
- Alarm email delivered from G7 Client PC
- Single set of sensor alarm setting

Direct Mode

Wireless Sensor & Base Station

G7 Client [Direct Mode]

RF Channel: 1

RF Channel: 2

RF Channel: 3

LAN Internet

Ethernet

G7 Client [Direct Mode]

single user

G7 Client Lite: suports max. 2 base stations
G7 Client Full: supports max. 20 base stations

< Meter

Station: 00004 - machine
Channel: humidity S01
Last Time: 2018-05-05 08:55:00

H: 30.000
L: 10.000
25.89°C
-20.00   40.000

H: 80.00
L: 40.00
60.39%
0.0000   100.00

2018-05-04 18:55:49   00004 - S01
Device Alarm A01:30.01 H01:118.9
B01:00110110

2018-05-04 18:55:48   00004 - S01
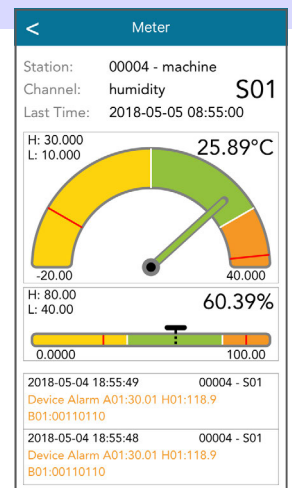Device Alarm A01:30.01 H01:118.9
B01:00110110

Free G7 Client Lite for Windows 10, iPad, iPhone & Android Phone

- Max. 2 base stations
- Each base station supports max. 64 sensors
- Sensor can be temperature, humidity, digital alarm, analog sensor
- Audio & Display alerts on alarm, Email Alert

How to upload data over mobile network?

- * **by connecting to 3G/4G router**
- * **insert SIM card**
- * **upload data via 3G/4G mobile network**

INTEGRATION

Support third party system integration:

1) TCP Modbus
   - via industrial standard Modbus data registers
   - TCP Modbus tool is bundled free
   - Data can be accessed by other SCADA directly
2) API driver
   - API dll for third party development
2) REST API
   - Web Service API for third party web portal
3) Centre Software
   - Data received and saved into text file

Easy Installation

1) Connect Base Station to Internet
2) Setup network properties
3) Download G7 Client App
4) Temperature Humidity Graphics View