

G-Finder™ Universal W1

# Explosion-proof Universal **Wireless Gas Detector**

PRODUCT CATALOG



**GAS**TRON



# About Gastron

## Save The Safety

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**Year of Establishment**

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# G-Finder™ Universal W1

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# Explosion-proof Universal Wireless Gas Detector

## G-Finder™ Universal W1

**G-Finder Universal W1 (GFU-W1)** is a wireless gas detector designed to reduce cabling burden and enable flexible network configurations at industrial sites. Based on Wireless HART communication, it supports a wide range of field infrastructures and allows for easy installation even in areas where wiring is difficult. With an integrated sensor and transmitter design, it optimizes installation space and ensures precise detection performance, while offering stable and reliable wireless communication.

By overcoming the limitations of conventional wired systems, the GFU-W1 provides a smart, on-site gas detection solution.



### ► Key Features

#### Wireless Gas Detector

- Utilizes stable WirelessHART communication
- Easy and quick installation without cabling
- Battery system supports continuous operation for up to 3 years
- Communication range up to 1 km

#### Supports Detection of 300+ Gases

- Compatible with various sensor types (electrochemical, infrared, etc.)
- Built-in SIL2-compliant diagnostics system for high reliability
- Flexible installation and sensor options for versatile environments
- Easy sensor replacement when changing target gas

#### High-grade Explosion-proof Grade

- Certified by KC, IECEx, ATEX for explosion protection
- Smart sensor with intrinsically safe explosion-proof structure

#### Interference-resistant Communication Technology

- Periodic channel switching to proactively avoid wireless interference
- Prevents collisions with orderly communication sequencing
- Minimizes interference using low 10 dBm transmission power
- Wide frequency band scanning to avoid interference communication
- Automatic routing for optimal communication paths
- Automatic detection and elimination of unstable channels

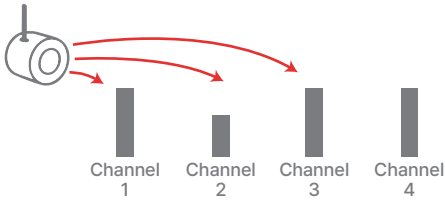
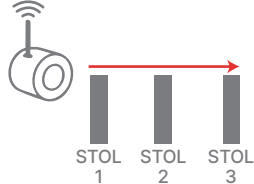
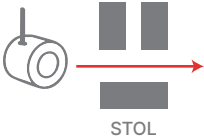
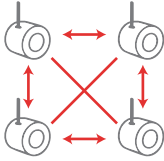
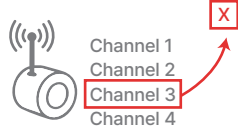
# Wireless Communication Structure

**WirelessHART**

## ► What is WirelessHART?

**WirelessHART** is a wireless communication protocol based on the international standard IEEE 802.15.4. Operating in the 2.4 GHz ISM band, it enables stable and reliable data transmission using frequency hopping and time-synchronized mechanisms. Due to its high reliability and scalability, it is considered an optimized communication solution for wireless gas detection systems.

## ► GFU-W1 Interference Prevention Technologies

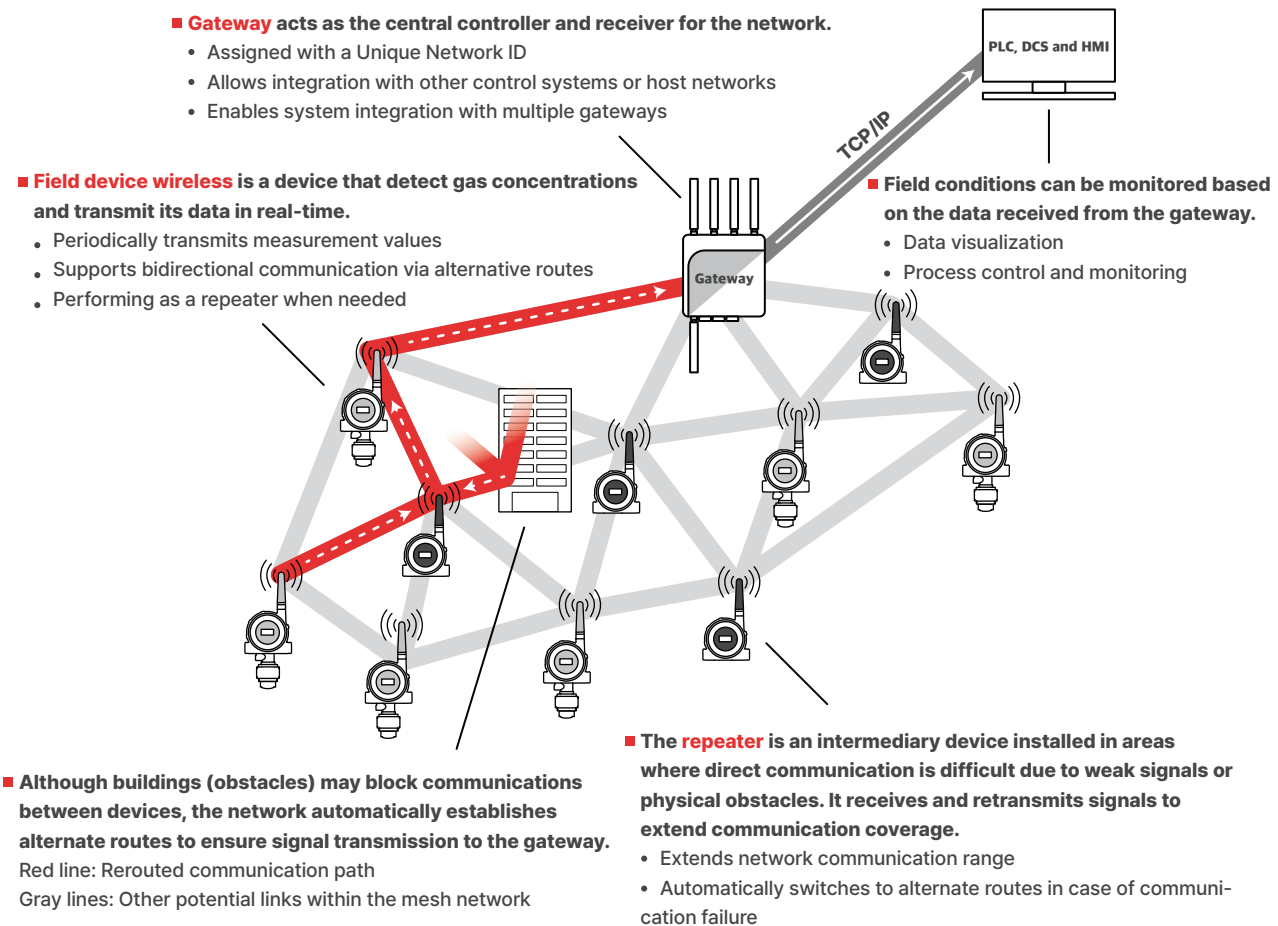
|                                                                                                                                                                                                                                  |                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Channel Hopping</b></p>                                                                                                                  | <p><b>Time Division Multiplexing</b></p>                                                                                  |
| <p>Periodically switches communication channels to avoid interference and <b>maintain stable network performance even in noisy environments.</b></p>                                                                             | <p>Data is transmitted and received only during the device's assigned time slot. This prevents interference between devices and <b>allows the gateway to efficiently handle a higher volume of data.</b></p> |
| <p><b>Power Modulation</b></p>                                                                                                                | <p><b>Direct Sequence Spread Spectrum</b></p>                                                                           |
| <p>Utilizes low transmission power (10 dBm) to <b>minimize interference</b> with surrounding wireless systems such as Wi-Fi or Bluetooth.</p>                                                                                    | <p>Spreads data over a wide frequency range using a unique spreading code. It enables <b>robust, interference-resistant, and secure communication.</b></p>                                                   |
| <p><b>Mesh Networking</b></p>                                                                                                                 | <p><b>Channel Blacklisting &amp; Assessment</b></p>                                                                      |
| <p>Employs a self-organizing mesh network where data is transmitted through the most efficient multi-hop paths. It ensures <b>high availability by maintaining communication even if some paths in the network are lost.</b></p> | <p>Continuously monitors communication quality and <b>automatically excludes channels with high interference, maintaining optimal channel performance.</b></p>                                               |

# Communication Map

## ► Main Components



## ► Communication Structure



## ► Number of Connectable Devices and Communication Cycle per Gateway

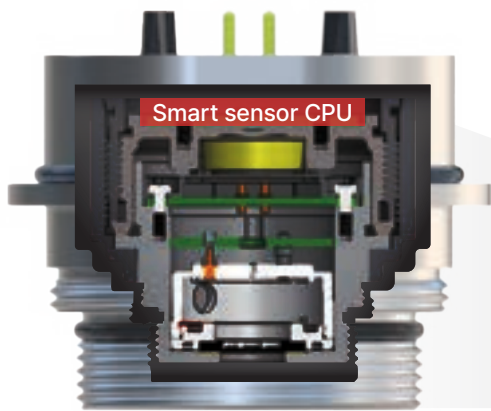
\*An alarm is triggered immediately upon event detection, regardless of the preset communication cycle.

| Update rate                    | 2sec | 4sec | 8sec | 16sec | 32sec | 60sec |
|--------------------------------|------|------|------|-------|-------|-------|
| Max No. of Connectable Devices | 25   | 50   | 100  | 100   | 100   | 100   |
| Gateway Load per Device        | 4%   | 2%   | 1%   | 1%    | 1%    | 1%    |

# Smart Sensor

## ► What is a Smart Sensor?

The **smart sensor** is a core technology of the GFU-W1. Its built-in high-performance CPU collects, processes, analyzes, and diagnoses gas measurement signals in real time, and transmits the data to the transmitter. Since the sensor itself performs detection functions, both the response speed and measurement accuracy are significantly improved.



<Cutaway View of Smart Sensor>



Plug-in

## ► Explosion-Proof Plug-in Type Sensor

### **Intrinsically Safe Structure Ex db ia IIC T6/T5/T4 Gb**

The **GFU-W1**'s electrochemical sensor is designed with an intrinsically safe structure that allows for instant replacement even in hazardous areas.

Thanks to its plug-in configuration, sensors can be replaced quickly and accurately without any tools — even by non-experts.

## ► Features of the Smart Sensor

|                                           |                                                                                                                                                                |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Easy Module Replacement</b>            | Quick and simple sensor replacement reduces maintenance time in the field.                                                                                     |
| <b>Auto Recognition &amp; Calibration</b> | Automatically recognizes sensor type and calibration data during installation.                                                                                 |
| <b>High Accuracy &amp; Reliability</b>    | Operates accurately even in various environments with built-in temperature compensation and self-diagnostic functions.                                         |
| <b>History &amp; Data Storage</b>         | Stores sensor ID and calibration information to improve traceability and reliability.                                                                          |
| <b>Supports Various Gases</b>             | Compatible with multiple gas sensor modules for flexible detection.                                                                                            |
| <b>Signal Diagnosis Function</b>          | Evaluates signal reliability in real time by processing gas signals. Handles signals related to power, temperature, communication, and circuit status signals. |

# Battery Configuration

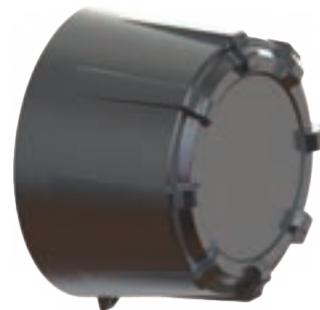
## ► Battery Specification

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The **GFU-W1** uses an industry specialized battery designed for long life, high stability, and high energy density.

- **Battery Type** | Lithium thionyl chloride battery
- **Battery Voltage** | 3.6V (average voltage during normal operation)
- **Battery Life** | 3 years (based on 2-second update rate)
- **Operating Temperature** | -55°C to +85°C



## ► Battery Features

### Remarkable Service Life

- Extremely low self-discharge rate (less than 1% per year)  
-> Suitable for long-term use
- Ideal for low-power devices such as wireless sensors and gas detectors

### World-class Energy Density

- Highest energy density among primary batteries
- Long-lasting power supply despite compact size  
-> Optimized for space-constrained devices

### Stable Operation Across Wide Temperature Range

- Operates reliably from -55°C to +85°C
- Suitable for extreme environments such as outdoor or hazardous areas

### Superior Stability and Chemical Resistance

- Maintains chemical stability even in high-temperature or high-pressure environments
- Sealed design minimizes risk of explosion or leakage (essential for industrial safety)
- No risk of gas emission or swelling thanks to primary battery properties

# Gateway Unit

## ► Gateway Specification

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<Explosion-proof Type>

The **gateway** collects and transmits GFU-W1 data wirelessly.

- **Communication Method** | WirelessHART (compliant with IEC 62591)
- **Data Transmission Cycle** | Minimum 500 ms interval
- **Power Supply** | DC 12–24V or PoE (Redundant configuration supported)
- **Explosion-proof Rating** | Ex nA II, T4



<Non-explosion-proof Type>

## ► Gateway Feature

### Wireless Sensor Network Configuration

- Wireless communication between sensors based on WirelessHART
- Wireless network configuration enabled by Wi-Fi Mesh+ technology (available for explosion-proof models)
- Connects all sensors on site without the need for complicated cabling.

### Easy and Direct Operation

- Provides intuitive GUI (interface) -> Easy installation and setup
- Supports OTA (wireless firmware upgrades) -> Maximized maintenance efficiency
- Includes real-time sensor status monitoring and automatic recovery

### Robust Security Design

- AES-128 encryption for sensor communication
- AES-256 and SSL-based multi-layer certification for system security
- Suitable for security-sensitive and strict regulatory environments

### Compatibility with Upper-level Systems

- Supports HART-IP (7.7), MODBUS/TCP, and various other protocols
- Seamlessly integrates with existing control systems (DCS/SCADA)

# Installation Type

## ► Mounting Type Options



### Wall Mount Type

- Description: The most common mount type, where the detector is attached directly to a wall.
  - Advantage: Easy to install, space-saving, and suitable for both indoor and outdoor use.
  - Components: Bracket / Anchor bolt / Nut
- 



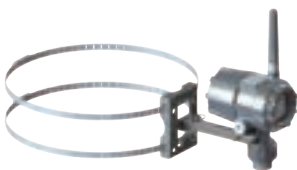
### Pipe Mount Type (Vertical)

- Description: The detector is mounted vertically on a pipe or conduit (50A standard).
  - Advantage: Allows precise measurement of gas concentrations around the pipe.
  - Components: Bracket / U-bolt / Nut
- 



### Pipe Mount Type (Horizontal)

- Description: The detector is mounted horizontally on a pipe or conduit (50A standard).
  - Advantage: Allows precise measurement of gas concentrations around the pipe.
  - Components: Bracket / U-bolt / Nut
- 



### Pole Mount Type

- Description: The detector is mounted on a pole or column.
- Advantage: Enables detection in outdoor or elevated locations.
- Components: Bracket / Hose clamp (customizable for various pole diameters)

# Accessories



## 01 Repeater

A relay accessory that extends the communication range of the GFU-W1. Supports stable data transmission up to 1 km with up to 3 hops. It minimizes signal loss even in obstructed environments.

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## 02 Battery

A lithium battery used in the GFU-W1 gas detector, offering a long service life of about 3 years with sufficient capacity for stable, long-term operation.

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## 03 Remote Antenna

An accessory that extends the antenna cable length, enabling flexible installation in difficult locations. It allows the antenna to be positioned at higher elevations for better signal reception and reliable communication.

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## 04 Remote Antenna | High Power

A high-power antenna with 6 dBi transmission performance that transmits signals farther in a specific direction. It can be adapted to various installation conditions for greater flexibility.

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## 05 Mounting Bracket

A bracket accessory for securely fixing the device. Provides stable mounting even in environments subject to vibration, external shocks, or harsh conditions.

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## 06 Splash Guard

Prevents liquid splashes from reaching the sensor. It is optimally designed for airflow to ensure proper response in the event of a gas leak.

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## 07 Dust Cap

Protects the electrochemical sensor from foreign substance. Recommended especially in locations where dust explosion protection is required.

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## 08 Sunshade

Functions as a protective cover to block direct sunlight, preventing sensor overheating and reducing measurement errors.

## ► Sensor Specification

| Measuring method    | Electrochemical cell                                                             | Infrared                         |
|---------------------|----------------------------------------------------------------------------------|----------------------------------|
| Measuring gas       | Toxic gas                                                                        | Hydrocarbon gas, CO2             |
| Measuring range     | 0 ~ 25% VOL (O2)<br>0 ~ 50ppm (H2S)<br>0 ~ 200ppm (CO)<br>0 ~ 100ppm (NH3) & etc | 0 ~ 100% LEL<br>0 ~ 5% VOL (CO2) |
| Response time(T90)  | < 15 sec (O2), < 50 sec (Tx)                                                     | < 25 sec                         |
| Material            | Stainless steel 316                                                              | Stainless steel 316              |
| Dimensions / Weight | 65(W) x 65(H) x 65(D) mm / 0.8kg                                                 | 65(W) x 65(H) x 65(D) mm / 0.8kg |

## ► Product Specification

| Measuring type                     | Diffusion type                                                                                                            |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Accuracy                           | ±3% / Full scale                                                                                                          |
| Parameter control                  | Non-intrusive control with a Magnet bar and Bluetooth wireless communication<br>(Calibration, Maintenance, Alarm setting) |
| Operation mode display             | Power, Alarm, Fault LED                                                                                                   |
| Measuring value display            | 2" Mono Segment LCD (with Backlight) display (Gas concentration, Target gas, Fault etc.)                                  |
| Alarm signal output<br>(Mos relay) | 100mA @ 28VDC / N.O. Relay contact (1 Stage alarm)                                                                        |
| Wireless output signal             | Wireless HART® HART 7.9 (Update rate 2 ~ 60Sec) / 2.4GHz ISM , 10dBm                                                      |
| External power (Option)            | 24VDC normal, 18 to 31VDC                                                                                                 |
| Battery pack                       | Lithium thionyl chloride cells 3.6V / 3Years Battery Life (Update rate 2Sec / Normal condition)                           |
| Material                           | Aluminium alloy or Stainless steel                                                                                        |
| Cable entry thread                 | Standard : PF 3/4" (Domestic), M20 x 1.5P (Overseas)   M25 x 1.5P, NPT 1/2", NPT 3/4", PF 1/2"                            |
| Operating temperature              | -40°C ~ 60°C                                                                                                              |
| Operating humidity                 | 0 ~ 99% RH (Non condensing)                                                                                               |
| Additional interface               | Bluetooth, Maintenance HART Port                                                                                          |
| Fault check                        | Battery Voltage, Memory, Sensor Status/Signal, System Status                                                              |
| Dimensions                         | 120(W) x 284(H) x 180(D) mm                                                                                               |
| Weight                             | 2.7kg (Aluminium alloy)   5kg (Stainless steel)                                                                           |

## ► Product Certification

| Explosion-proof certification | KCs      | Korean Explosion Proof Certification        | Ex ia IIC T4 Ga<br>Ex ia IIIC T135°C Db<br>(-40°C < Ta < +65°C) |
|-------------------------------|----------|---------------------------------------------|-----------------------------------------------------------------|
|                               | NEPSI    | Chinese Explosion Proof Certification       |                                                                 |
|                               | ATEX     | European Explosion Proof Certification      |                                                                 |
|                               | IECEX    | International Explosion Proof Certification |                                                                 |
| Other certifications          | SIL2     | Safety Integrity Certification              | IEC61508, EN50402, EN50271                                      |
|                               | CE(EMC)  | European Electromagnetic Certification      | EN50270, EN00328                                                |
|                               | CE(RED)  | European Radio Equipment Certification      | EN50270                                                         |
|                               | KC       | Korean Electromagnetic Certification        | -                                                               |
|                               | HART     | Communication Protocol Certification        |                                                                 |
|                               | CE(RoHS) | European Hazardous Substances Certification |                                                                 |