Nordic PPE Agency
DETECTION & PROTECTION

Guide to Choosing Communication Technology for Gas Detectors

When selecting communication technology for gas detectors, it's crucial to consider both the working conditions and the environment where the equipment will be used. Below is an overview of Bluetooth, LoRa, 4G, and NFID to help you choose the right solution for your needs.

1. Bluetooth

Bluetooth is a short-range technology suitable for situations where direct communication occurs between the gas detector and a nearby monitoring device.

Advantages:

- **Low power consumption:** Ideal for battery-powered devices.
- **Easy setup:** Quickly connects to smartphones, tablets, or computers.
- **Local monitoring:** Suitable for scenarios where a safety officer is close to workers.
- **Mobile integration:** Useful when a person carries both a gas detector and a mobile phone, sending measurements to an app that a colleague outside can monitor via the mobile network.

Disadvantages:

- Limited range (typically 10–30 meters indoors and up to 100 meters outdoors).
- Signal interference from walls, metal structures, and other wireless traffic.

Typical Applications:

- Lone work with nearby monitoring.
- Work areas without many physical obstacles.
- Confined spaces with mobile phone integration, allowing remote monitoring via an app.

2. LoRa (Long Range)

LoRa is a long-range technology ideal for environments requiring stable connections over greater distances.

Advantages:

- **Long range:** Covers several kilometers, even in urban areas.
- **Strong signal penetration:** Suitable for environments with buildings, tanks, and underground areas.
- **Low power consumption:** Perfect for battery-powered devices.
- **Cloud connectivity:** Safegas LoRa solutions connect to the Safegas Cloud, enabling real-time remote monitoring.

Disadvantages:

- Low data rate: Suitable for simple data transmissions.
- Requires a LoRa gateway to receive and forward data to a PC or cloud.
Typical Applications:
- Monitoring workers in sewers, tanks, or other confined spaces.
- Projects needing long-range communication with low data requirements.

3. 4G (Mobile Network)

4G offers wide coverage and high data speed, making it ideal for real-time data applications.

Advantages:

- **Global coverage:** Usable almost anywhere with mobile network access.
- **Fast data transmission:** Ideal for applications requiring high data volume or continuous monitoring.
- **Direct connection to the cloud or monitoring center without additional hardware.**

- **Disadvantages:**
- Higher power consumption compared to Bluetooth and LoRa.
- Requires a SIM card and mobile subscription, leading to recurring costs.

Typical Applications:

- Situations where many employees are in hazardous areas, monitored in real-time by a safety officer.
- Projects requiring data transfer directly to a central platform or cloud.

4. NFID (Near Field Identification)

NFID is a technology for data transfer over very short distances, typically a few centimeters. It's relevant for gas detectors for specific configurations or transferring small amounts of data.

Advantages:

- **Precise application:** Suitable for configuring devices without a physical connection.
- **Low power consumption:** Can function without constant power supply.
- **Simple setup:** Easy for tasks like software updates or parameter adjustments.

Disadvantages:

- Very limited range: No remote reading capability.
- Data transmission can be vulnerable to interference and errors.
- Not suitable for real-time monitoring or large data volumes.

Typical Applications:

- Adjusting settings on gas detectors.
- Transferring small, non-critical data.
- Firmware updates or diagnostic data.

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Technology Selection Based on Scenarios

Scenario	Recommended Technology
Lone work near a monitoring device	Bluetooth
Work in a tank or sewer with remote monitoring	LoRa
Multiple workers in risk areas with real-time data	4G
Remote monitoring over large areas	LoRa or 4G
Close monitoring without many obstacles	Bluetooth
Confined space with mobile phone integration	Bluetooth
Configuration and parameter adjustments	NFID

Summary

- **Bluetooth**: Best for short distances and simple setup.
- **LoRa**: Ideal for long range and low power consumption.
- **4G**: Provides high data speed, suitable for advanced real-time monitoring.
- **NFID**: Suitable for configuration and short-distance data transfers.