REINHELDT R-FTIR 2000

Ultra-Vision Remote Gas Analytics

The 2026 Global Benchmark for Autonomous Chemical Intelligence

The **Reinheldt R-FTIR 2000** is an elite evolution in remote sensing, engineered to transform complex atmospheric data into high-definition chemical intelligence. Designed for the most demanding industrial and environmental monitoring environments, it delivers non-contact, real-time visualization of over 400 gases across vast distances with unmatched precision.

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1. Advanced Optical System & Hardware Architecture

The R-FTIR 2000 utilizes a refined optical bench to maximize signal-to-noise ratio (SNR) and maintain alignment under extreme outdoor conditions.

- **Interferometer Technology:** Features the **Reinheldt Coaxial Double-Moving-Mirror Design**. This independently designed system is inherently resistant to high-frequency vibrations and thermal expansion, making it ideal for rooftop installations or vehicle-mounted emergency patrols.
- **Stirling-Cooled MCT Detector:** Operates at a cryogenic **200 °C** using a maintenance-free Stirling cycle refrigerator. This extreme cooling eliminates thermal noise, allowing for the detection of trace gas concentrations (ppm levels) at distances up to **5 km**, with a maximum visibility range of **20 km**.
- **Cassegrain Large-Aperture Optics:** Equipped with a **120 mm light-concentration system** featuring gilded reflectors and infrared high-antireflection films. This enables a high-precision **6 mrad visual angle resolution**.
- **High-Speed Scanning:** A 360° horizontal PTZ combined with a 2D rotary galvanometer (120° times 60°) achieves rapid hemispherical coverage and targeted "smart" scanning of key risk areas.

2. AI-Driven Analytics: "The Neural Core"

The R 2000 moves beyond standard spectroscopy through its integrated **Deep Neural Network (DNN) Algorithm**.

- **Tri-Stream Fusion Imaging:** Seamlessly merges three visual streams—**Starlight-level Visible**, **Night-Vision Thermal Infrared**, and **FTIR Chemical Imaging**—into a single, unified augmented reality overlay.
- **Dynamic Cloud Visualization:** Generates a real-time heatmap that visualizes gas cloud size, motion paths, temperature gradient fields, and concentration gradients (ppm.m).

- **Autonomous Leakage Tracing:** The system automatically locks onto gas clusters to back-calculate the precise coordinates of the leakage source, even in dense industrial zones.

3. Technical Specifications & Performance

Component	Technical Detail	Strategic Benefit
Spectral Range	600 - 5000 cm^{-1} (Expandable)	Full coverage of the "fingerprint" region for 99% of gases.
Detection Limit	PPM to Percent levels	Measures everything from trace leaks to critical plumes.
Data Acquisition	216k / 24-bit ADC	FPGA+ARM architecture for **3.2G high-speed processing**.
Laser Reference	TEC Stabilized VCSEL	Temperature-controlled laser with **5x extended operational life**.
Spectral Library	400+ Standard / Expandable	Built-in database of TICs, VOCs, and combustion products.
Protection	IP54 Rated & DLC Window	Diamond-like coating for extreme weathering resilience.

4. Intelligent Software Suite

The **Reinheldt Command Center** provides a unified interface for site-wide safety and Industry 4.0 integration:

- **Cloud-Ready Connectivity:** Supports both private and public cloud integration, allowing for joint operations across multiple computers and interface with local environmental authorities.
- **Full Data Traceability:** Every measurement saves the full infrared spectrum, visible/thermal pictures, compound types, GPS position, and timestamps for legal compliance.

- **Customizable Monitoring:** Program autonomous "patrol" modes for key areas (valves, storage tanks) with automatic alarms and real-time data uploading to centralized servers.

5. Primary Applications

- **Industrial Safety:** Continuous monitoring of petrochemical parks for fugitive VOC emissions and toxic gas leaks.
- **Environmental Protection:** Large-scale spatiotemporal mapping of air pollution and industrial discharge.
- **Emergency Response:** On-board vehicle deployment for non-contact risk assessment at accident scenes.
- **Fire Prevention:** Remote detection of high-temperature heat sources and toxic combustion byproducts unidentifiable by the human eye.

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