

## Service solutions with remote monitoring

### HASHIMOTO Kenta

HORIBA Techno Service (HTS) is responsible for the maintenance, repair, and servicing of HORIBA products. Since 2020, under the constraints imposed by the COVID-19 pandemic that limited customer site visits, HTS has developed remote solutions as new service proposals, leveraging advancements in information technology, IoT, and AI. This paper introduces efforts not only to achieve stable operation of instruments through remote monitoring, but also to reduce on-site workload, expedite problem resolution, and enhance the skills of service engineers, which are essential for service quality.



### Introduction

For enhancing the reliability and maintaining the performance of analytical instruments, not only improvements in instrument functions and capabilities but also routine maintenance are indispensable. In particular, analytical and measurement instruments are often required to operate continuously under constant monitoring, and the installation environment or characteristics of measurement samples can frequently present harsh conditions for the instruments. As such, daily maintenance plays a significant role in ensuring the reliability of measurement results.

### Company Overview of HORIBA Techno Service

HTS is a service division spun off as a wholly owned subsidiary of HORIBA, established on March 21, 2000, and celebrating its 25th anniversary in 2025. As of 2025, 27 service stations are located in major regions and industrial areas nationwide as operational bases. The national

service stations are managed by four regions: East Japan, Central Japan, Headquarters, and West Japan, providing maintenance and repair of HORIBA analytical instruments and responding to customer needs in each area.

In February 2021, the new headquarters and Kyoto Service Station building (Figure 1) was completed. To strengthen and expand domestic and international service operations, HTS established the Analytical Solution Plaza—an analytical laboratory—along with centralized facilities for training, calibration, and technical support centers to serve as customer inquiry points<sup>[1]</sup>. By collaborating with group companies operating in 29 countries and regions worldwide, HTS is reinforcing the construction of “Service Lifecycle Management,” which supports customer product operation, equipment management, and analytical consulting. Emphasizing customer proximity and regional engagement, HTS aims to provide prompt service and pursue solution-based business through application proposals and consulting.



Figure 1 HORIBA Techno Service Head office.

### Maintenance of Analytical Instruments and Troubleshooting Cases

The substances and physical properties analyzed and measured are diverse and numerous, and HORIBA offers a wide variety of analytical instruments with differing measurement principles depending on sample characteristics and measurement targets. To perform qualitative and quantitative analysis, instruments utilize various chemical and physical reactions of the measurement targets. When instrument trouble occurs, causes are investigated by collecting objective facts based on measurement principles, product structure, and characteristics, and by referencing past troubleshooting cases. However, when troubles arise from complex factors or unprecedented cases, identifying the cause may take time. Many issues can only be understood on-site, necessitating direct investigation by service engineers. Consequently, lengthy periods from on-site cause identification to repair completion can occur, potentially lowering customer satisfaction.

Since 2020, with the social push for telework and restrictions on customer site visits due to COVID-19, customers

strongly demanded rapid restoration to normal operation when instrument failures led to missing measurement data. To address this, HTS developed a remote monitoring system for data collection and visualization of instrument status, enabling swift identification of failure points and causes and facilitating efficient repair responses.

### Overview of the Remote Monitoring System

Figure 2 shows the configuration of the remote monitoring system using the EMIA solid carbon/sulfur analyzer.

The EMIA terminal PC and Gateway are connected via RS-232C serial communication. Signals received from the instrument are encrypted by the Gateway and transmitted (uploaded) to the server via carrier network and internet. Signals from the instrument (measurement counts, maintenance signals, maintenance history, alarm history, etc.) are monitored at the Technical Support Center (Figure 3) for signs preceding abnormalities, abnormal values at the time of failure, and critical alarms, enabling prompt customer support. The monitored signals are one-way and do not acquire any analytical data from customer instruments. Monitored signal values and data are reported monthly to customers as operational status reports.

Currently, this remote monitoring system is being fully deployed for solid carbon/sulfur analyzers “EMIA-Pro/Expert”, solid oxygen/nitrogen/hydrogen analyzers “EMGA-Pro/Expert”, and laser diffraction/scattering particle size analyzers “LA-960V2/LA-350”. These instruments are widely used in quality assurance and quality control departments, playing a vital role in customer product quality management. Because instrument performance is closely linked to product quality, ensuring normal operation is of utmost importance.

HTS also offers various efficiency improvement services tailored to customer needs, such as “AOP Connects” (Figure 4), which adds remote instrument status monitoring by specialized engineers to the comprehensive maintenance service plan “AOP (All in One Plan).”

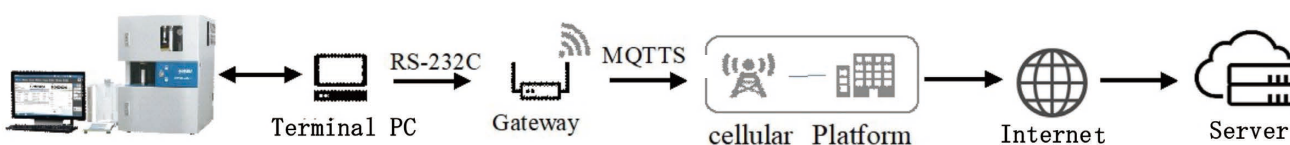


Figure 2 Outline of Remote monitoring system for EMIA.

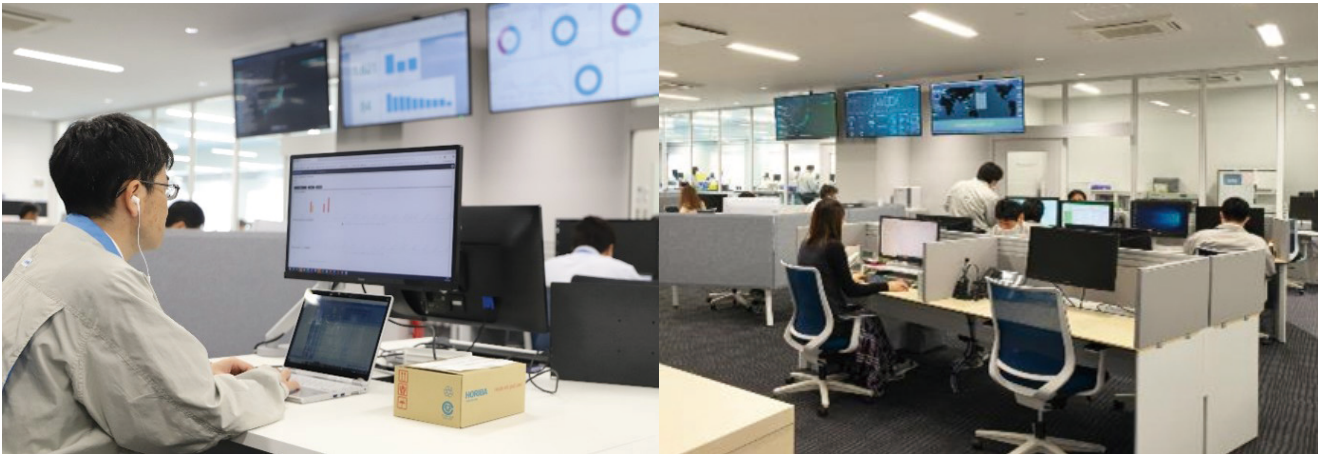


Figure 3 Technical Support Center.

### Preventing Equipment Failures through Early Detection of Abnormalities

Remote monitoring allows for tracking changes in instrument signal values over time. Dedicated engineers at the Technical Support Center monitor daily fluctuations, and as shown in the red box in Figure 5, when a signal value begins to fluctuate beyond its usual range, it is recognized as “abnormal.” The engineer contacts the instrument user to confirm whether any abnormal measurements have been detected and recommends maintenance.

While annual maintenance is typically scheduled at the customer’s convenience, in this case, HTS was able to provide maintenance service at the optimal timing before the abnormality affected analytical measurements, thereby preventing equipment failure.

### Reducing Downtime by Predicting Failures in Advance

In standard repair responses, engineers often identify failures or defective parts based on information from customers and past cases via phone or email, but discrepancies between estimated and actual issues frequently occur, necessitating re-visits or additional work.

A dedicated engineer at the Technical Support Center detected a detector temperature alarm and analyzed recent temperature changes. Normally, detector temperature fluctuates within  $55^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$ , but as shown by the blue graph in Figure 6, increased fluctuations were observed and judged abnormal. Suspecting depletion of thermal compound (heat-conductive grease), the engineer coordinated with on-site engineer to prepare in advance, enabling rapid repairs and reducing analyzer downtime.






-  **In the unlikely event of a failure, HTS will respond free of charge from investigation to recovery, including parts replacement. (Excludes holidays and outside business hours.)**
-  **HTS constantly monitors the equipment status and provides optimal support.**
-  **HTS confirms stable equipment operation with an annual inspection.**

Figure 4 Comprehensive maintenance inspection service with added remote monitoring<sup>[2]</sup>.

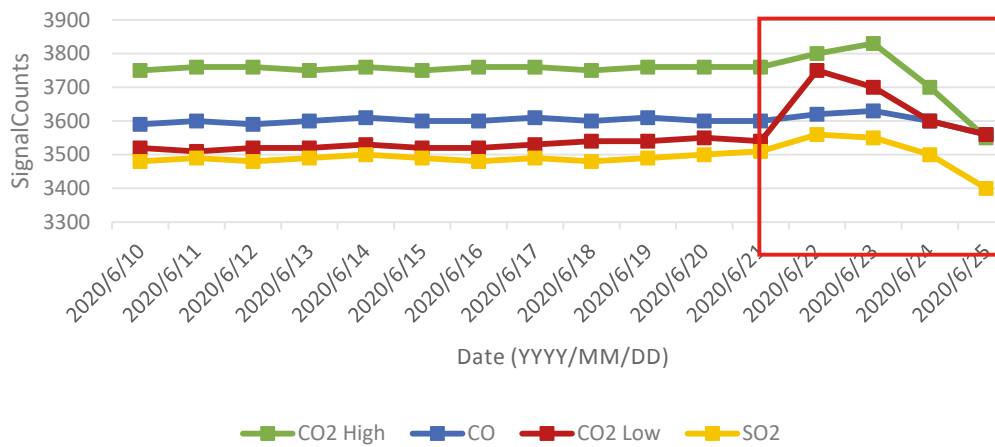


Figure 5 Interday variation of signal counts from instrument.

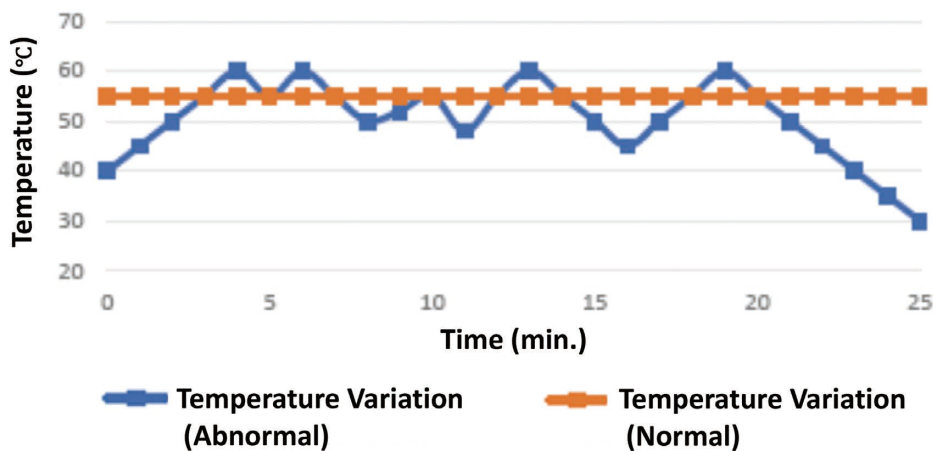


Figure 6 Transition of detector temperature.

### Monitoring Installation Environment via Remote Management

As shown in Figure 7, monitoring revealed several increases in CO<sub>2</sub> Low count values throughout the day. Since it was difficult to determine from monitoring alone whether this indicated an instrument abnormality, the dedicated engineer at the Technical Support Center contacted the on-site engineer to check the customer’s usage conditions. It was found that a stove was being used to heat the analysis room. After confirming the measurement conditions, it was verified that the instrument readings were unaffected. When monitoring data alone is insufficient for judgment, collaboration with on-site engineers allows HTS to provide services that enable customers to use analytical instruments with greater peace of mind.

### Remote Monitoring during Earthquakes

Remote monitoring also enables tracking of instrument operational status. While HTS’s strength lies in providing prompt support from service stations close to users, there are cases where distant users cannot be reached quickly. For example, when a major earthquake (maximum seismic intensity 6+) struck off Fukushima Prefecture in March 2022, the Technical Support Center checked the operational status of customer instruments equipped with remote monitoring. For customers whose instruments were not operating, HTS contacted them to confirm their safety and status. Fortunately, no instruments were affected by the earthquake, and customers expressed gratitude for the check-in. Thus, remote monitoring serves not only as a support for instrument failures but also as a solution providing reassurance to customers.

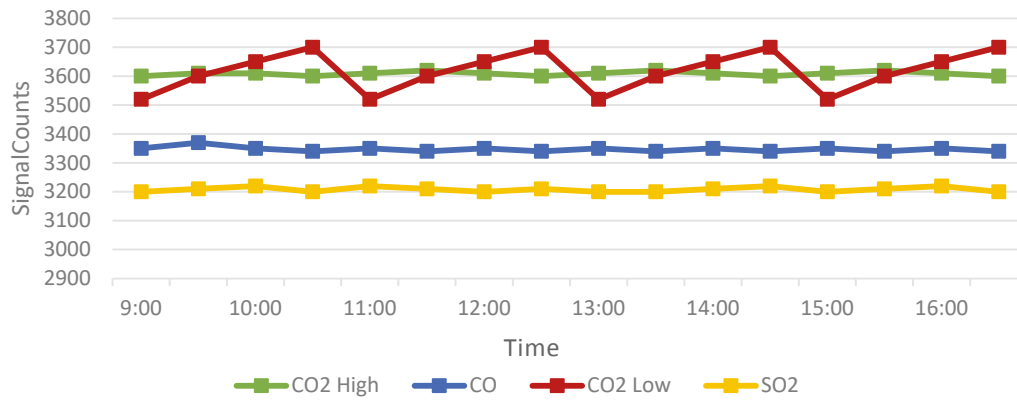


Figure 7 Interday variation of signal counts.

## Global Support and Training of Service Engineers

HORIBA’s measurement and analytical instruments are sold worldwide, making support for overseas engineers increasingly important. For instance, when a reticle/mask defect inspection system for semiconductors was delivered to the Middle East, local engineers lacked sufficient product knowledge and technical skills. Initially, experienced engineers from Japan were scheduled to be dispatched for installation, but international conflict made this impossible. Instead, remote support was provided from Japan for the local engineers’ installation work. Camera footage was used for guidance, and analytical software operation was instructed remotely via TeamViewer<sup>TM\*1</sup>. In this way, remote support enabled HTS to meet customer needs and support engineers even when local service was difficult.

\*1 TEAMVIEWER is a registered trademark or trademark of TEAMVIEWER GERMANY GMBH.

## Conclusion

This paper has described the remote monitoring services provided by HTS, related case studies, and skill enhancement of engineers through remote support. While IoT and AI utilization are becoming commonplace, how they are applied has a significant impact on business. As automation and labor-saving in corporate manufacturing processes increase, the need for stable instrument operation and rapid response to failures also rises. Furthermore, training engineers with high-level skills remains an urgent issue in the field.

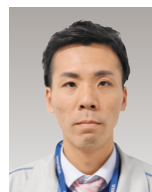
HTS aims to improve customer satisfaction by continuously providing new solutions that meet evolving needs from a position closer to customers. Additionally, HTS is

committed to enhancing the skills and problem-solving abilities of engineers both domestically and internationally through online training, remote support, webinars, and online manuals.

\* Editorial note: This content is based on HORIBA’s investigation at the year of publication unless otherwise stated.

## References

- [1] 阪口 真以, “堀場テクノサービス ‘Analytical Solution Plaza’ の紹介: 「はかる」と「わかる」をつなぐHORIBA のサービス”, *Readout*, No. 56, pp. 40–45, 2022. (in Japanese)
- [2] <https://www.horiba.com/jpn/service/solution/service-product/remote-support/>



**HASHIMOTO Kenta**

Materials & Semiconductor Team  
Field Strategy Office, Global Strategy Division  
HORIBA Techno Service, Co., Ltd.