

# Thermo Electron ViewPoint

**Next-generation remote monitoring software platform empowers users with superior communications, control, and data management capabilities**

## The critical need for robust, open, and scalable monitoring systems

The world has become a more paranoid place in recent years, and for good reasons: dirty bomb threats, chlorine leaks resulting from train wrecks, and poisonous gas in the Tokyo subway system—not to mention the disasters of decades past at Chernobyl and Three Mile Island—all have conspired to put safety at the top of everyone's priority list. In light of these and other episodes, it's become increasingly clear that real safety depends on a comprehensive system for monitoring radiation and hazardous environmental conditions.

Yet most of the enterprise systems available today are based on low-end solutions that don't lend themselves to running large volumes of data or remote sensing of the types and quantities of information that need to be monitored. Furthermore, the closed and proprietary nature of these systems ultimately restricts their capabilities by limiting the ways they can be upgraded or enhanced; and the majority of monitoring systems currently on the market are incapable of running samples as frequently as may be required in the case of an incident—say, every 1 to 10 seconds. Finally, extreme reliability is absolutely essential for the systems that handle the demands of today's enterprise sensor monitoring, data collection, and remote control; but because many of the systems currently in use do not put enough importance on the correctness of their data messages, they open themselves up to errors.

The danger of faulty data structures in monitoring scenarios is real; for example, they can lead to the generation of false alarms that undermine the system's credibility so that a true positive reading may be overlooked or dismissed without follow up. Considering the potential consequences of a radiation or environmental contamination situation that escapes detection, it's difficult to overstate the critical need for robust, open, and scalable monitoring systems to deal with the challenges of today and tomorrow.

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## Addressing the monitoring challenges of the 21st century

The ViewPoint system from Thermo Electron provides a next-generation remote monitoring software platform that delivers real-time personnel and area monitoring during routine and outage operations in the nuclear power industry. Also for use in environmental, industrial, civil defense, and security monitoring applications, the ViewPoint system provides users the ability to centrally process and analyze instrument/detector data and integrate detectors from Thermo Electron's portfolio as well as from third-party vendors. ViewPoint enables increased

efficiency and optimization of operational management by integrating personnel, area, and process monitoring for radiation data into a single application.

## Encapsulating the data engine for extreme reliability

The ViewPoint appliance is a self-supported ViewPoint operating environment that comes pre-loaded with the ViewPoint data engine and specified plug-ins. The appliance consists of an industrial computer processor unit that delivers all of the power, flexibility, and ruggedness of an industrial PC in a small format that is approximately one-third the size of a standard PC. The data engine receives data from the system inputs (instruments/devices), routing them to one or more destinations—typically one or more PCs for display, job coverage, or database logging. The appliance provides “plug-and-play” capabilities, while providing additional system back-up functionality and reliability.

The appliance's operating system is completely pre-loaded at the Thermo offices and continually checked against a known environment for operations on multiple platforms such as a typical field application might involve. This approach—which is unique to the ViewPoint platform—enables Thermo to identify and isolate potential errors, immediately notify users, and quickly make changes. It also minimizes users' IT support by avoiding issues that can arise from CD or online installations.

The ViewPoint platform ensures enterprises' business

continuity by providing a second “black box” so that, should anything cause the first unit to go down, a second, fail-safe back-up unit is immediately available. The system also provides self-diagnostic capabilities that further enhance its reliability; the data engine monitors itself and can communicate any errors directly and automatically to Thermo for expedited troubleshooting. Because all ViewPoint systems are configured identically, an issue that’s discovered on one system can trigger Thermo to release a corrective update that’s sent to all other systems—fixing potential problems before they occur.

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### **Streamlined interface reduces costs and errors**

Because the world of monitoring involves multiple kinds of instruments, as well as variations on these instruments based on the types of data they provide, the monitoring system’s graphical user interface (GUI) has been a major obstacle for most software applications in representing the data from each specific instrument. Thermo Electron circumvents this problem with the ViewPoint platform by opening up the architecture and building a back end that “generalizes” the GUI; when new instruments are added, the user has immediate access to those instruments’ data, as well as to all of ViewPoint’s functions.

Chemical sensors, radiation sensors, and other instruments all have the same look and feel in the ViewPoint software, and users can navigate through the application as usual without the need to learn how to deal with each new device. By significantly diminishing the learning curve, ViewPoint saves companies valuable time and minimizes the

risk of adding new instruments, reducing costs and leading to enhanced return on investment. Another key advantage of streamlining the interface is a reduction in human performance errors—which contributes to superior decision-making capabilities based on accurate, actionable data.

### **Open architecture enables companies to build on their investment**

ViewPoint’s open system architecture gives companies the ability to implement a phased approach to adding instruments or sensors to their system—opening up their options and allowing them to build on their initial investment in the way that makes the best business sense for them. They can control their capital expenditures, leveraging their existing hardware—whether from Thermo or a third-party vendor—while bringing all of their data into a conformed, concise structure.

This openness enables companies to bring instruments online as need and budget dictate without repurchasing the entire application, extending the system with affordability and flexibility to use the equipment that’s best suited to the application—regardless of manufacturer.

This approach of standardizing instruments to the platform for freedom of choice and optimum scalability is unique to Thermo Electron’s ViewPoint platform.

### **Only ViewPoint offers two-way communication of real-time data**

True two-way communication is a reality with the ViewPoint system, enabling real-time data flow between the instruments and the software. This communication is independent of communications protocol, so that, for example, a single system might have modules for both Verizon and Cingular Wireless technologies—the data engine transparently takes care of communications routing and data routing while the user sees only a single graphical user

interface. Users can manipulate the sensors remotely to make parameter changes or to check their performance, and they can interrogate the remote devices’ log files.

This powerful, positive two-way control capability lets users interrupt the instruments’ communication patterns to adjust the rate of responses; for example, in the case where a user has been notified of an emergency situation, he or she might want to set all monitors on high-response mode. It’s real-time communication taken to the extreme, designed to capture hard data as rapidly as possible and communicate it immediately to the personnel responsible for initiating a timely, appropriate response.

Companies and security agencies can also leverage ViewPoint’s two-way communication capabilities to enact training simulations that help them improve their scenario evaluation capabilities and fine-tune their contingency plans.

ViewPoint leverages three different communication modes for the transfer of data among the host application, field units, and remote sensors: IP-based Internet communications, satellite communications, and third-party wireless hardware systems. These communication modes are interchangeable, depending on the nature of the situation, user requirements, and the demands of the response scenario. Any given incident or situation might well utilize multiple data engines that communicate with each other—all using the same GUI such that the interaction is completely transparent to the end user. Additionally, ViewPoint can “tunnel” between two data engines, mirroring them so that all the instruments from both systems are visible to the end users, who are empowered by the increased amount of data and their ability to manipulate the sensing devices.

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### Layers of redundancy preserve continuity of data flow

Even in the extreme scenario where a break with all outside communications should occur, mobile field units can still continue monitoring a situation. If the connection is lost between a vehicle and the central facility, the central facility can still see

all of the drop probes—which will automatically switch over to one of the other two communication modes if their primary mode should fail. Should the mobile field units or the central facility lose their primary means of communication, these systems will automatically roll over to the satellite network, passing data directly from the probes to the field unit.

In a response-type situation, these redundant layers of communication ensure that data is still captured and logged—regardless if all lines of communication are lost.

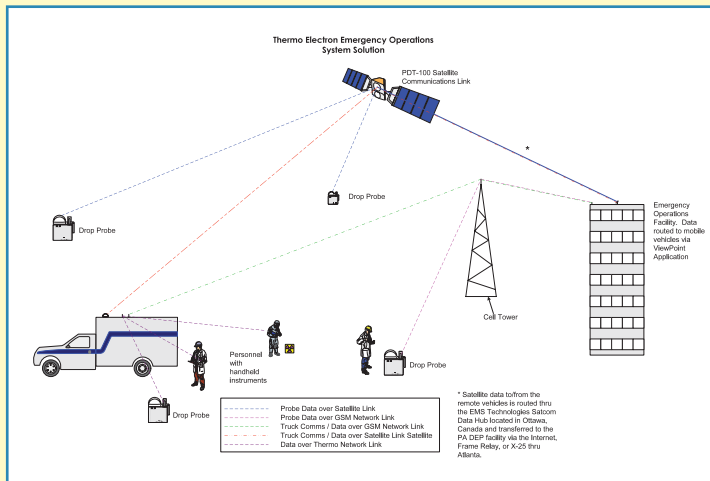
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### Enhanced data management capabilities deliver maximum flexibility

In the same way that ViewPoint provides an open architecture for its communications modes, it also delivers an open architecture framework for back-end database support. The ViewPoint system permits logging of data to any ODBC-compliant database without requiring users to know the proprietary interfaces to the databases. Unique user IDs can be assigned to either individual users or groups of users, enabling them to leverage customized monitoring features such as filtering; they can decide which devices on the ViewPoint system they want to log data from, and group and manipulate the data in ways that suit the application. For example, a table can be created in the database that will log only data from the chemical sensors; another table might record only data from the radiation instruments. These individual logs can go to separate databases or to separate tables within the same database, and users can define at what rate and intervals to log the data.

Users can also specify to log only data that exceeds a given value, say, 50 millirem per hour. They can run logic processes using parameters such as and/or statements, or elect to log data based on change from established values. These data management capabilities provide users with enormous flexibility since they no longer have to log every bit of data from every single instrument. Instead, they can log only the information that is critical to a given situation or application—minimizing the space needed for logging the data and minimizing the overhead required to handle the logging. Users no longer have to go through a high-level querying process to analyze the

### Multiple instruments, clients, and detectors—one manageable application



### ViewPoint uses multiple communication methods to facilitate data transfer among the host system, field units, and remote sensing devices.

The graphic illustrates the dynamic communication capabilities of the ViewPoint platform. The building at right is a central facility running a ViewPoint system, while the van at lower left is also running its own ViewPoint system. Their proximity to each other is irrelevant.

Because the system is transferring data over three different links—satellite, GSM network, and Thermo radio network—personnel in both the central facility and the van can see all of the instruments from each operational system, regardless of location—including the drop probes that are communicating directly with the satellite. Operational personnel can also see devices from other monitoring vehicles running the ViewPoint systems, any drop probes, and all of the monitored personnel.

These combined lines of communication are unique to the Thermo Electron ViewPoint application—and they are blurred because it doesn't matter to the application whether the data is coming through a GSM modem, a satellite, or the Thermo radio network.

data; rather, they can simply reference the tables created for each instrument when they run their maps and charts, project long-term trending, and so forth.

ViewPoint also provides a very controlled environment for database logging by restricting the users who can log data onto the system—ensuring a high level of security and preserving the integrity of the data.

### Unique to ViewPoint—powerful recording feature enables real-time data replay

ViewPoint takes the concept of two-way, real-time communications into a new dimension by recording all of the data that comes into the system at the binary level on any port or pathway. Not unlike the TiVo concept for television, this powerful data recording feature is only available in the realm of radiation and environmental monitoring through Thermo Electron's ViewPoint platform.

The data recording feature was originally conceived as a diagnostic tool; if any questions arise during an incident, users can replay the data files in real time—using standard video recording features such as Play, Stop, and Pause—to help them understand exactly what happened at any given moment. For example, at what interval did the system alarm? What did the data show when the system alarmed? ViewPoint's data recording capability can also serve as a troubleshooting tool by enabling experts to review the system's performance during an incident to see whether all components behaved as expected.

Companies or agencies can also use this feature as a way

to critique the effectiveness of a completed response activity, or as a training simulator. In light of current concerns about national security readiness, ViewPoint's data recording feature offers a means to fortify and refine response systems and personnel so that, in the event of a worst-case scenario, the situation can be detected and contained as rapidly as possible.

### Conclusion

While many devices/systems on the market can effectively measure radiation in the environment, only the ViewPoint system from Thermo Electron provides a platform robust enough to:

- Centralize instruments and sensing devices from a host of vendors in a single, manageable application
- Deliver real-time, two-way transmission capabilities, leveraging redundant layers of communication
- Provide an open architecture framework for back-end database support and maximum flexibility in data management

The unique combination of these capabilities enables ViewPoint users to continue using their existing installed base of equipment for optimal return on investment while quickly and accurately capturing hard data for an appropriate, timely response. As Thermo Electron continues to enhance the ViewPoint system, leveraging the most advanced technology available to provide ever-more powerful capabilities and solutions, companies and agencies gain the tools they need to help make the world a safer place.

### ViewPoint Specifications

Operates with Microsoft® Windows® Client Software Requirements:

- Microsoft Windows NT® 4 Service Pack 6 or
- Microsoft Windows 2000 Service Pack 4 or
- Microsoft Windows XP Service Pack 1 or higher

### Thermo Electron Corporation

Thermo Electron Corporation is the world leader in analytical instruments, providing solutions that enable its customers to make the world a healthier, cleaner, and safer place. The company's Life and Laboratory Sciences business provides analytical instruments, scientific equipment, services, and software solutions for life science, drug discovery, clinical, environmental, and industrial laboratories. The firm's Measurement and Control business provides analytical instruments used in a variety of manufacturing processes and in-the-field applications, including those associated with safety and homeland security. Based near Boston, Massachusetts, Thermo has revenues of more than US\$2 billion, and employs 10,000 people in 30 countries.

For more information, visit: [www.thermo.com](http://www.thermo.com).

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