



Safety News 39

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Introduction

Today's Safety News follows on from the previous issue (Safety News 38 – download [here](#)) and once again brings new information from the field of drug analysis and **two interesting technical innovations**. In the previous issue of Safety News, we introduced the new version of the **G510x** portable GC-MS system from **Teledyne FLIR**, which is optimized for rapid **confirmatory** analysis of street drugs. As this is a full-fledged GC-MS system, the capabilities of laboratory instruments are retained. This includes the ability to analyze complex mixtures, including drug samples where low concentrations of highly potent substances are masked in a spectrally complex matrix. All other currently available techniques for field analysis often fail with this type of sample, and GC-MS analysis is the only reliable solution. You can watch a nice promotional video showing the G510x in action in the field here: [\[HERE\]](#)

Fifteen Griffin 510x devices have now been delivered to **U.S. Customs and Border Protection**, which will use them in the fight against drug smuggling. The **G510x** device can identify **trace amounts of nitazene, fentanyl, and other opioids**, including mixtures with **xylazine**, within **five minutes**, even when highly diluted with other substances. The situation is very similar in the United Kingdom, where more than 20 standard versions of the Griffin 510 device have been purchased for the same application.

Below in this issue, you will find an example of the use of Griffin 510 devices in addressing a new threat spreading in the United Kingdom—**easily available vape cartridges containing "spice" (synthetic cannabinoids)**.

This year is also exceptional in terms of the number of newly introduced CBRNe detection devices, including groundbreaking technologies. In this issue, you will find another example, **the VipIR mobile spectrometer**. Almost ten years after the launch of the first combined Raman/FT-IR spectrometer **Gemini** (Thermo Fisher Scientific, more [here](#)), the new Raman/FT-IR spectrometer **VipIR** is entering the scene. This is not so much a direct replacement for the Gemini device (which remains a completely unique device in some respects), but rather **a shift**

towards the field of advanced forensic analysis and confirmatory analysis of complex samples using completely new procedures. Details can be found below in this issue.

1. Invitations to professional events and webinars

FLIR webinars - radiation:



Teledyne FLIR invites you to a series of free webinars on radiation technology

Teledyne FLIR is pleased to announce a series of **free virtual webinars** to be held during the week of **November 18, 2025**. These webinars will focus on the latest devices in the FLIR portfolio, **the identiFINDER R425 (November 19, 2025)** and **the identiFINDER R700 (November 20, 2025)**. Each webinar will last approximately **40-60 minutes** and will feature a **multimedia presentation** with product information, examples, demonstrations, maintenance, and practical tips. Participation is **completely free**, and each webinar will be available at **three different times—3:00 p.m., 7:00 p.m., and 3:00 a.m. (the following day)**—to accommodate participants from different time zones.

The webinar dedicated to **identiFINDER R225** has already taken place, and a recording of the webinar is available [here](#).

Among other things, the following features and innovations will be demonstrated during the webinars:

- Exceptional **sensitivity to gamma and neutron radiation**,
- **Simple and intuitive operation**,
- Various **Reachback (triage)** methods,
- New options for **displaying and controlling up to four R700 devices** from a single mobile device,
- **Radiation Field Guide**, which can help **responders evaluate measurements**,

- **System Health Checks** for maximum device uptime and minimized maintenance costs,
- ...and much more!

 Reserve your spot for the webinars [HERE!](#)

FLIR Webinar – Fido X4:



This webinar will offer a **practical demonstration of TNT and HMTD explosive detection using the Fido X4 device**. It will also include an **overview and demonstration of basic device maintenance**. We will show you **how to perform a verification test on the Fido device**, introduce **the latest firmware update**, and explain **how to install it**. Finally, we will focus on **how our explosive detection algorithm works**.

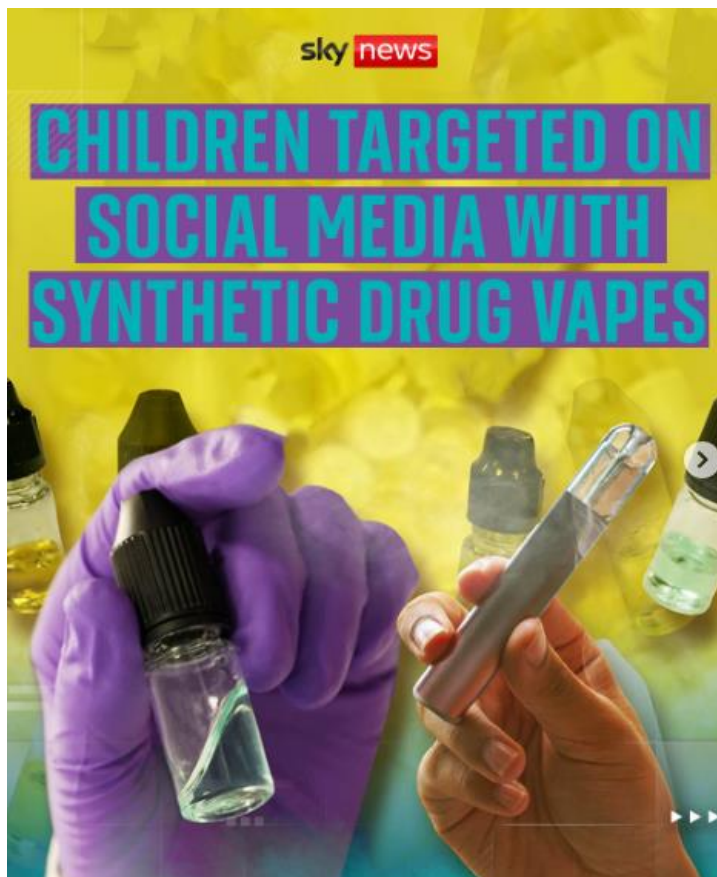
The webinar combines a **live presentation and video content** and will last approximately **30 minutes**. Afterwards, there will be a **discussion and Q&A session** with the product manager and experts on the topic.

The webinar will take place via the **Microsoft Teams** platform on Wednesday, **November 18, 2025**, at the following times: **3:00–3:30 p.m.** and **7:00–7:30 p.m.**

 Reserve your spot for the webinar [HERE!](#)

Can't make it to the live webinars? Don't worry, the next issue of Safety News will include links to recordings of each webinar. If you don't want to wait until the next Safety News, feel free to contact us and we will be happy to send you the links.

2. "Spice vapes" – an old problem in a new guise. A new threat.



In recent years, a new wave of synthetic drugs known as "**Spice**," "SCOPE," and other exotic names has appeared on the European and British markets. These are substances originally developed for research into the endocannabinoid system. Substances such as **JWH-018**, **JWH-073**, **CP 47, 497**, and **HU-210** now pose a serious problem for public health and safety. These compounds mimic the effects of THC, but with a much stronger and unpredictable effect. This is not a new problem; these substances (and cases of overdose) have been around for some time. Previously, however, "Spice" was sold in the form of herbal mixtures (plant material coated with a layer of these substances), or more recently, CBN or CBG cannabis sprayed with one of these substances (but also substances such as PINACA, FUBINACA, etc.). The latest trend, however, is shifting the use of **synthetic cannabinoids** to **e-liquids** – so-called **spice vapes**. These are often promoted on social media under the misleading label "**THC liquid**." **This is a new threat with a relatively high level of danger, as it is very easy to overdose when using "spice vapes."**

Spice vapes – the new face of an old problem (data taken from Christopher Pudney, *#EvidenceWeek, Sense about Science*)

According to data presented during **Evidence Week 2025** in London, **13% of the e-liquids analyzed** contained synthetic cannabinoids, but actual THC was detected in only 1% of cases.

Inhaling these mixtures has already caused dozens **of children in the UK to collapse in schools and be hospitalized**. Dealers also use social networks as a public marketplace, with the offer concentrated mainly on Instagram and TikTok, and the transaction then completed on encrypted platforms. It is estimated that in the UK alone, there are **more than 100 dealers** actively offering "spice vapes" online.

Field identification of these substances in e-liquids is extremely difficult. Synthetic cannabinoids are found in **trace concentrations** in "spice vapes," often mixed with glycerol, flavorings, or other additives. In addition, each new chemical variant requires updating databases and reference spectra. Traditional GC-MS systems used in laboratories provide a high degree of certainty of correct results, but field investigators also need fast and reliable tools that can **identify suspicious substances on the spot**. This has been difficult until now, as even modern field methods for identifying substances such as FT-IR, Raman spectroscopy, or non-separative mass spectrometry **fail with this type of sample. When analyzing these samples, the use of Griffin™ G510 and 510x mobile GC-MS instruments has proven successful in the UK**, providing virtually the same quality of results in the field as laboratory GC-MS analyses.

Griffin™ G510 – a laboratory in the field

The **Griffin G510** portable system is a powerful **GC-MS analyzer** designed for rapid identification of unknown chemicals – from explosives and chemical warfare agents to **narcotics and new psychoactive substances**. Thanks to integrated mass spectrum libraries (NIST, SWDRUD, and FLIR libraries) and intelligent software, it allows users **to detect and identify even very complex mixtures within minutes**, directly at the scene of the incident. The system allows the analysis of liquid, solid, and gaseous samples with accuracy comparable to laboratory GC-MS. For more details, see the previous issue of Safety News No. 38 (download [here](#)).



3. ProtectIR: New software for identifying mixtures in the field using FT-IR spectrometry



The new generation of **ProtectIR™** devices from **908 Devices** brings improvements in the analysis of solid and liquid mixtures in the field. Thanks to the improved **Condensed Phase Mixture Analysis (CPMA)** algorithm, it can correctly identify individual components even in more complex mixtures, where traditional FTIR technology has often failed or been unable to identify all components in the mixture.

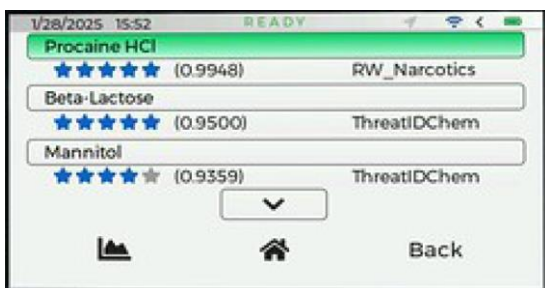
What's new?

At the heart of the innovation is a **sophisticated search algorithm** that works in several analytical layers. Each layer gradually refines the identification by evaluating **spectral similarity, uniqueness, and overall data consistency**. This process minimizes false positives, eliminates misidentifications, and enables **reliable identification even for mixtures with four or more components**.

An independent study has confirmed that **ProtectIR™** with its new algorithm outperforms older FTIR instruments in all monitored parameters:

- **+42.2%** higher probability of a correct result (True Positive Rate)
- **-30.9%** fewer false positive results
- **-61.6%** fewer false negative results

In addition, new chemometric procedures make it possible to calculate **the actual reliability of identification separately for each identified component** of the mixture. This is expressed both numerically and graphically – by the number of stars (2 to 5 stars). This visual approach is already familiar to users of **XplorIR** instruments or when analyzing gas mixtures on **ThreatID™** spectrometers.



Knowing the reliability of identification for each individual component in a mixture is an important parameter and a significant improvement over the previously used approach, where the device software displayed the value as a percentage of the area corresponding to the identified substance out of the total spectrum area. However, this value does not say anything about how reliably the substance is identified in the mixture. In cases where a substance exhibits only two small peaks that are clearly isolated in the spectrum, even an area of less than 3% can lead to reliable identification, and conversely, even 10% of the total area does not guarantee reliable identification in cases of spectral overlaps.

In the case of the analysis of complex real samples, such as some street drugs, solvents contaminated with precursors for the production of chemical weapons, or mixtures of waste solvents, the approach used to date with % area display has been very unreliable. For identified substances with an area of less than 10%, it was necessary to verify the composition using another technique, or in the case of **Gemini** instruments, by "tagging", but this was limited to specific cases.

The new software in **ProtectIR™** devices not only improves performance when analyzing complex samples, but also provides **significantly better information about the quality of the data obtained**, which is essential for field operators when making critical decisions about further action based on these results.

Advantages of the new software for CBRNe and HAZMAT teams

In practice, this means that response units have a **fast, robust, and highly accurate tool** for working with:

- chemical warfare agents
- industrial toxins
- drugs and precursors
- explosives
- unknown mixtures of common chemicals

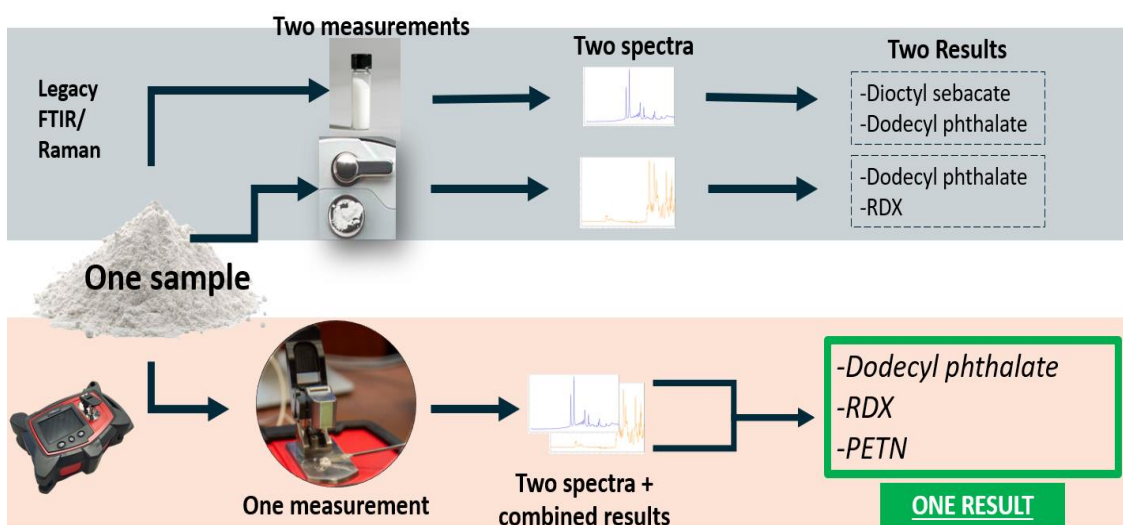
Try out how **ProtectIR™** works

If you would like to see how **ProtectIR™** works and what it can do when analyzing your samples, don't hesitate to contact us. The **ProtectIR™** device is now also available at our company.

4. New VipIR™ 3-in-1 field spectrometer

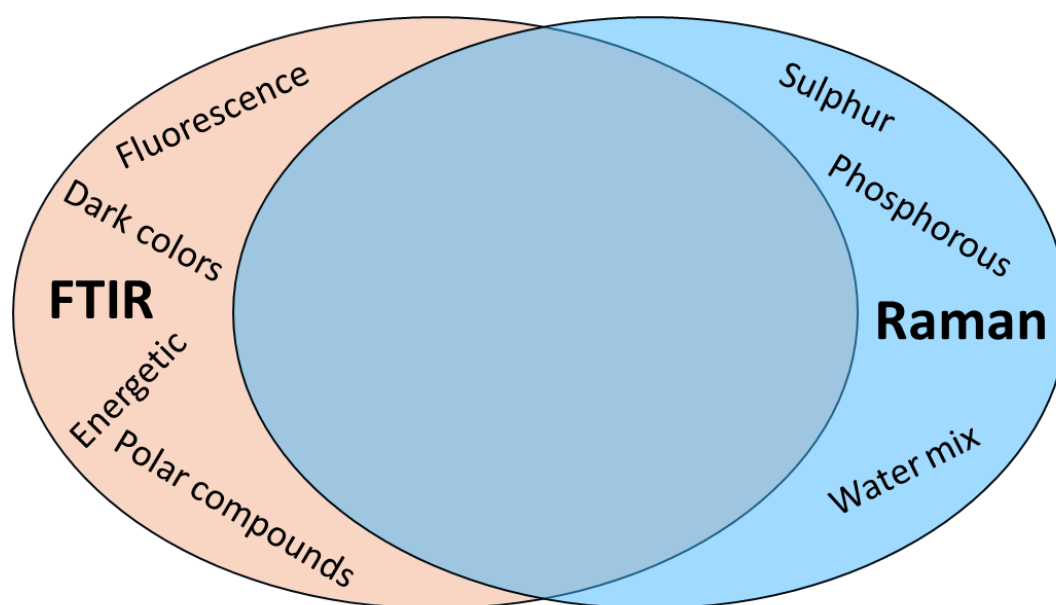


908 Devices has launched the **NEW VipIR™**, a portable device that combines **FTIR** and **Raman** spectrometry with a revolutionary algorithm for automatic substance identification called **Smart Spectral Processing (SSP)**. Both FT-IR and Raman spectra can be measured in a single step, followed by advanced chemometric analysis. The goal is **to significantly streamline, accelerate, and simplify the identification of unknown solid and liquid substances directly in the field, including more complex mixtures of multiple components**. Until now, combined FT-IR/Raman spectrometers have been a matter of two autonomous systems that did not communicate with each other. It was therefore possible to perform FTIR or Raman analysis separately, without subsequent linking of spectral information. In addition to the traditional measurement method, **VipIR™** also allows the use of a combined FTIR and Raman sampling interface. This provides two sets of spectral information from a single measurement (and the same sample), followed by advanced AI processing of spectral information from both analytical techniques in a single process.



Advantages of combining Raman and FTIR spectrometry = **complementary techniques**

- The identification capabilities of both techniques **overlap to a large extent** for a wide range of compounds.
- However, they use **different mechanisms** (absorption vs. scattering), which offer **specific advantages**. Raman spectrometry features intense bands of symmetric vibrations, while infrared spectroscopy features asymmetric vibrations. In addition, some samples are **only active in FTIR**, and some are **only active in Raman spectrometry**.
- Conventional Raman spectrometers allow the measurement of spectra at lower wavelengths (typically up to 250 cm^{-1}) than routine FT-IR spectrometers (typically from 650 cm^{-1}), making them more suitable for the identification of certain inorganic substances
- Historically, the two techniques have used different sampling interfaces (**ATR vs. probe/vial**).
- Both techniques use a comparison of the measured spectrum with the spectrum in the database.

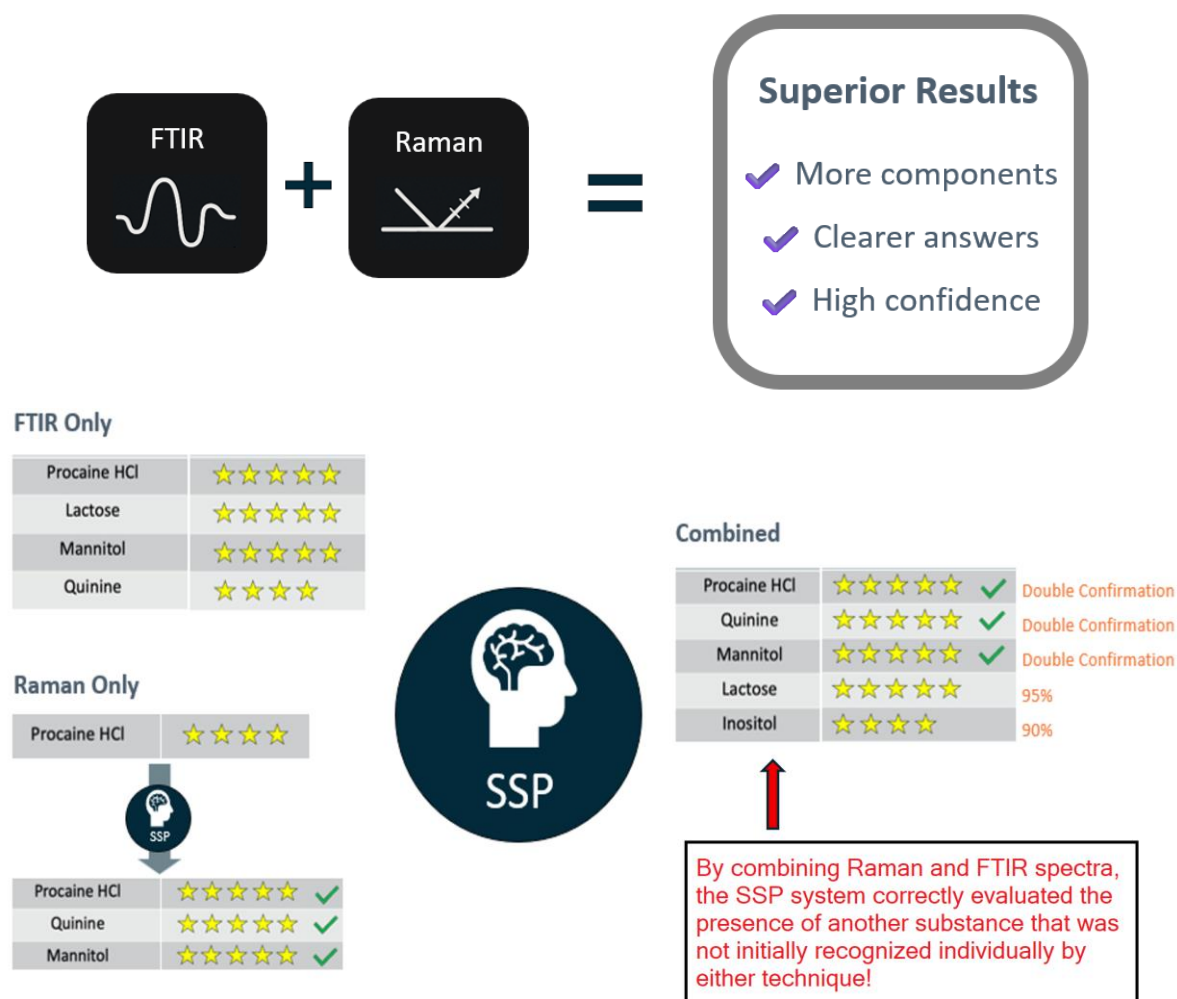


From the above, it is clear that combining information from both techniques is ideal for achieving maximum identification capabilities. In forensic practice, it is also common to use confirmatory analysis with a second technique to verify the results. According to the recommendations of the SWDRUG association, ideally a method from category A, which includes FT-IR, Raman, GC-MS, NMR, or XRD. In the field, the combination of FT-IR and Raman spectrometry is most commonly used.

SSP (Smart Spectral Processing) algorithm – **what makes it unique?**

SSP is a **proprietary algorithm** that **combines data** from **FTIR and Raman spectroscopy**. AI (machine learning) principles were used in its development. While an operator would

normally have to evaluate the results of these methods separately, **SSP** ensures that **the information from both spectral techniques complements, confirms, or refutes each other**, resulting in a single **verdict with a high degree of certainty**. As with the new software for the **ProtectIR** instrument, advanced chemometric techniques are used to determine the reliability of identification for each individual component in the mixture (see above). In addition, the SSP algorithm also determines (and marks with a green check mark) all components whose identification is reliably verified by both techniques (confirmatory analysis). **This is a fully automatic process independent of operator intervention. This further increases not only the reliability of identification, but also the validity of the entire process.**



Key features of SSP

- **Improved mixture analysis** – better identification of substances in complex samples
- **Greater reliability** – results confirmed by two independent spectroscopic methods
- **Increased sensitivity** – ability to detect threats (substances) that may not be "visible" in the sample when using both techniques separately

Extensive spectrum database

VipIR™ is equipped with **more than 39,000 reference spectra** (FTIR + Raman) covering drugs, explosives, chemical warfare agents, industrial toxic substances and materials, common chemicals, and , as well as an extensive database of commonly used materials (so-called consumer products). This enables fast and accurate identification of a wide range of substances at the scene of an incident.

State-of-the-art hardware, comprehensive software

VipIR™ is a device designed to appeal to a very wide range of users. In addition to traditional areas, it also targets advanced forensic or customs analysis (it can be easily used both in the laboratory and in the field), mobile laboratories, and university workplaces. The device is equipped with an FT-IR spectrometer with excellent SNR (signal-to-noise ratio) and standard spectral resolution of 4 cm⁻¹. However, the Raman spectrometer falls into the category of very powerful spectrometers, using optics with high spectral transmittance and a highly sensitive detector, which enables very fast spectrum acquisition with low noise and the application of modern techniques for fluorescence background compensation. A laser with a wavelength of 785 nm is used, which offers the best compromise between sensitivity, fluorescence size, and work safety. It is important to note that samples with very high fluorescence are easily measured by FT-IR spectrometry in combined FT-IR/Raman spectrometers. The Raman spectrometer is equipped with three sampling techniques: 1) Standard flexible Raman probe in a ruggedized version. This is a research-grade Raman probe that can be connected to other accessories (SERS attachments, nose cones for contact measurements, etc.). 2) A place for direct measurement in vials; the vial is placed at an angle in the device so that even very small sample volumes can be measured. (a separate probe focused on the vial is used). 3) Another unique feature is the universal interface, where both the FT-IR and Raman spectra are measured from the same point. From the point of view of data quality assurance, it is very important that both spectra are obtained from an identical sample. This is sometimes a problem when analyzing non-homogeneous samples (typically, for example, some drug tablets). In addition, thanks to its design, this interface allows for the safe analysis of even thermally very sensitive samples!

VipIR Interactive FTIR-Raman Spectrometer



The spectrometer software also meets all requirements for multi-level use – separate accounts with different levels of access to various device functions can be created for individual users.

Thanks to integrated communication functions (Wi-Fi, LTE), results can be easily transferred to the TeamLeader application for cloud storage, report printing, advanced data analysis, and NOW also with the option of **centralized device management** (more in the next Safety News 😊).

Basic technical parameters:

VipIR	Specifications
Size	37.1 × 21.8 × 14.7 cm; 4.3 kg
FTIR	4000–650 cm ⁻¹ , 4 cm ⁻¹ resolution
Raman	250 - 2875 cm ⁻¹ , 7 – 10.5 cm ⁻¹ resolution
Laser	785 nm; power up to 450 mW
Sample interface (solids and liquids)	Raman flexible probe, standard sample holder, combined FTIR (ATR) and Raman sample interface, SERS accessories
Robustness	IP 67, Mil 810G
Decontamination	Spraying, wiping, or immersion in chlorine or detergent solution
Library	16,000 Raman, 23,000 FTIR
Power	Rechargeable Li-Ion battery and mains power supply
Communication	Wi-Fi, LTE, Team Leader
Fleet Management	Team Leader for centralized device management and a unified operational overview

Want to learn more? Want to try out the VipIR device? Don't hesitate to contact us at sale@rmi.cz. The device is now also available at our company.

Additional support materials on the [908 devices](#) website

5. New firmware and software for your devices



New Pendar X10 software version 2.8.3: Nitazeny and other new substances in the library

Pendar Technologies has released an important update to the software and library for the Pendar X10 spectrometer (**version 2.8.3**).

New features

- 60 new substances added to the library, including **23 nitazens (including isotonitazene, etonitazene, and clonitazene)**, other new **synthetic opioids, and new explosives**.

Improvements

- New support for updating via the internet or file using PendarLink 2 (after updating the Pendar X10 software to version 2.8.3).

Bug fixes

- Automatic shutdown during inactivity no longer occurs when uploading large files using PendarLink 2.
- Improved error messages when using PUF files for updates.

This major update cannot be performed online. To perform the update, please contact us at: sale@rmi.cz.

Firmware version 2.8.4 has also been released, which addresses the loss of time data on some older Pendar X10 units after upgrading to version 2.8.3.



PendarLink 2.1: required for all Pendar X10 devices with firmware 2.8 and higher

PendarLink 2.1 is a new release that is required for all Pendar X10 devices using firmware version 2.8 and above. You can download PendarLink 2.1 [HERE](#)

New features

- Starting with Pendar X10 software version 2.8.3, updates via the Internet or from a file using PendarLink 2 are now supported.
- PendarLink 2 now allows connection via Wi-Fi. If the device is connected to the same Wi-Fi network as the device, it is possible to establish a connection via Wi-Fi by entering the Wi-Fi address of the device Wi-Fi.

Improvements

- The selection method has been redesigned to better match modern Windows desktop applications.

- The options of using Shift+click, Ctrl+click, or checkboxes make it easier and faster to select multiple scans, self-tests, or user library items.
- A progress indicator has been added during update installation, similar to the indicator on the Pendar X10.

Bug fixes

- Problems with updating from a file have been resolved.

Your team at **RMI, s.r.o.** – we are here for you 😊. RMI, s.r.o. Horka 221, 533 41 Lázně Bohdaneč, Tel.: 466 921 885, 466 921 404, e-mail: sale@rmi.cz

