

MIRION
Connect **21**
Annual Users' Conference



WebiSmarts Area and Stack Monitoring System

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Mirion Connect | Annual Users' Conference 2021
Aurora, Colorado

Rotem Industries Ltd | Overview

Profit Centers



INDUSTRIAL PARK



RADIOACTIVE WASTE



**RADIATION
DETECTION**



Sapphire Domes



**MEDICAL IMAGING
(PET PRODUCTS)**

Nuclear Power Plants

- 30 Years partnership with Mirion Technologies
- Rotem Instruments are found in over 85% of the NPP's in the USA



Nuclear Medicine



Global Partners



WebiSmarts

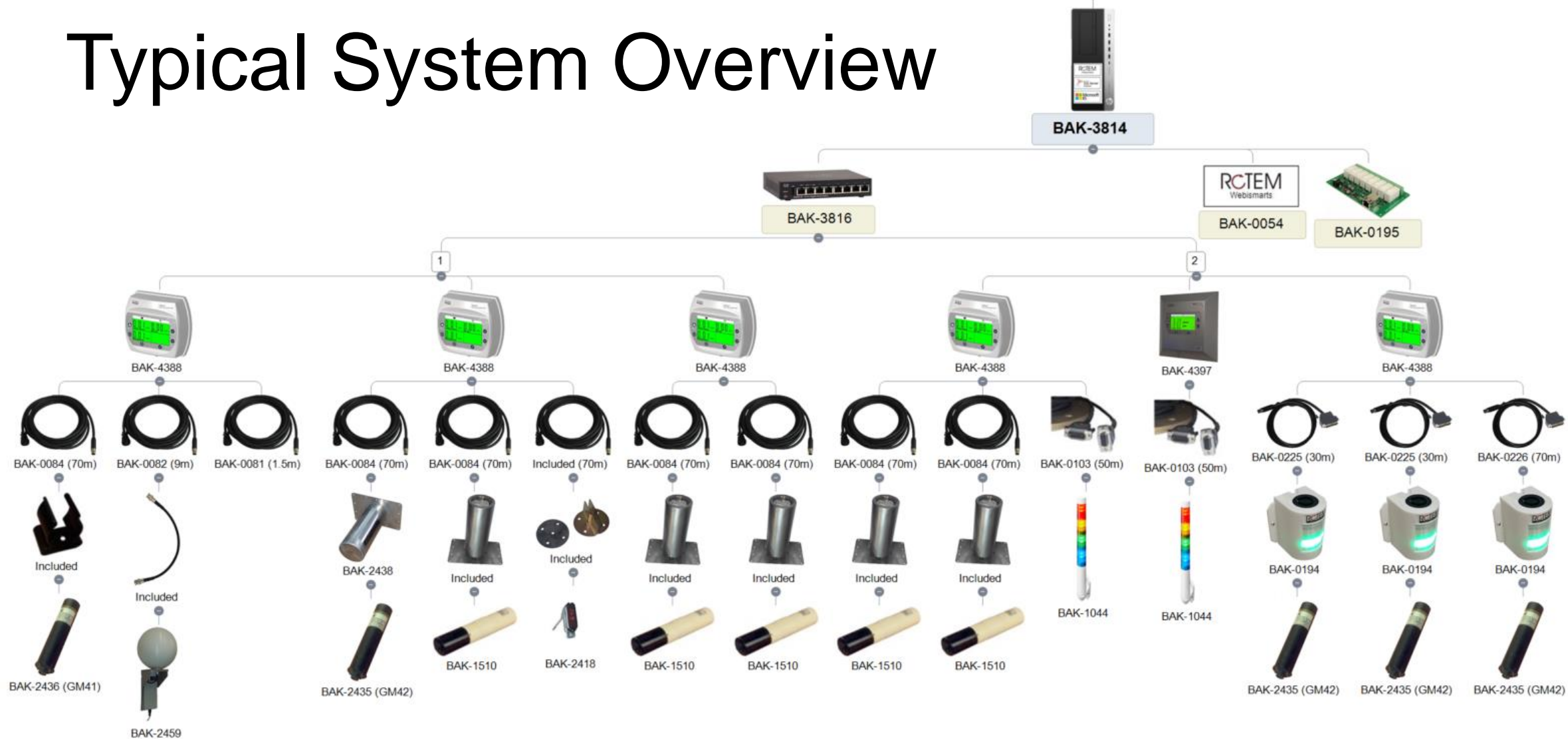


30% Market share Internationally
Over 100 Sites in USA and Canada

Main Components

- DPU-3 Monitor
- Web Based Software
- Coincidence Exhaust Stack Monitor
- Peripherals

Typical System Overview



DPU-3 Monitor



DPU-3 Monitor Features

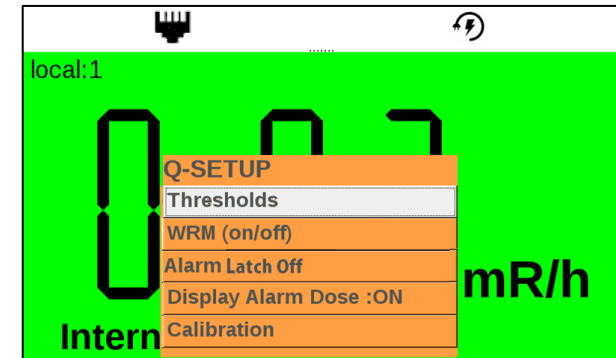
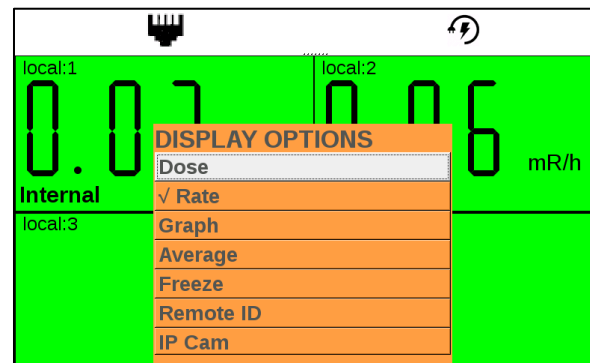
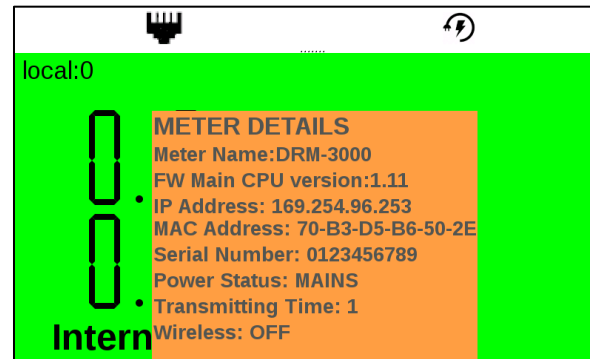
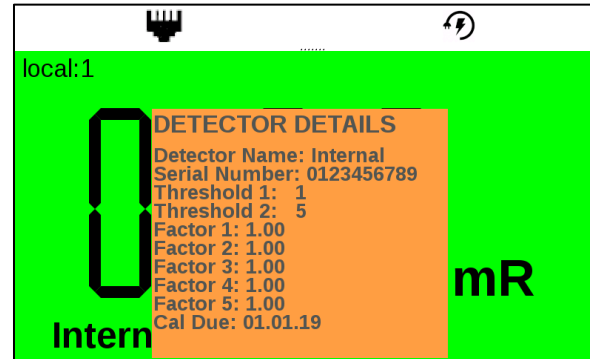
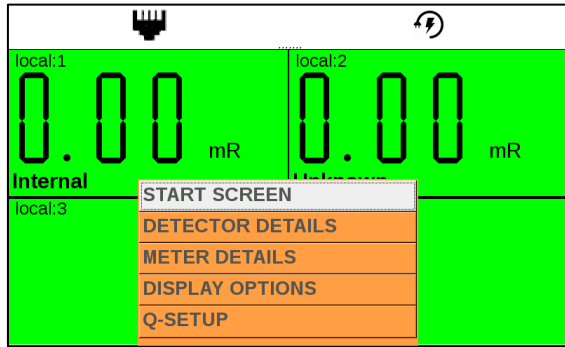
- Supports 1 internal and 3 external detectors + 4ma - 20mA input
- Displays up to 4 detectors simultaneously
- Background Subtraction
- Accumulate and Save Dose Rate & Dose – 1 month
- Auto recognition of All Rotem, and other detectors
- Large 7" TFT Graphic Display
- Background color reflecting the dose rate level against 2 threshold settings.
- IP-65, Durable Plastic Casing
- Advanced communication: POE, TCP/IP, RS-485, Wi-Fi, Xbee,
- Wall or Tabletop mounted
- Backup Battery (24 hours)
- Setup/Diagnostics via internal webpage



Compatible to a wide range of detectors



DPU-3 Menu Driven Features



DPU-3 Auxiliary Socket Configuration

1	4-20mA Output (Detector 1)		
2	4-20mA Output (Detector 2)		
3	4-20mA Output (Detector 3)		
4			
5	4-20mA Output (Internal detector)		
6			
7			
8	RS485 B/RS232_RX		
9	RS485 A/RS232_TX		
10	+24V OUT (Power To Flow Meter)		
11	Flow Meter Input (4-20mA)		
12	24V GND (Power To Flow Meter)		
13	TWR CLEAR/*see comment	Threshold # 1	Det #1
14	TWR AMBER/*see comment	Threshold # 2	
15	TWR GREEN/*see comment	Threshold # 1	Det #2
16	TWR BLUE/*see comment	Threshold # 2	
17	TWR RED/*see comment	Threshold # 1	Det #3
18	TWR BZR1/*see comment	Threshold # 2	
19	TWR BZR2/*see comment	Threshold # 1	Internal
20			
21	TWR 24V OUT		

* Also can be used as NPN transistor open collector output that can handle 24VDC,200mA where the emitter is grounded, and collector is only connected to the connector.

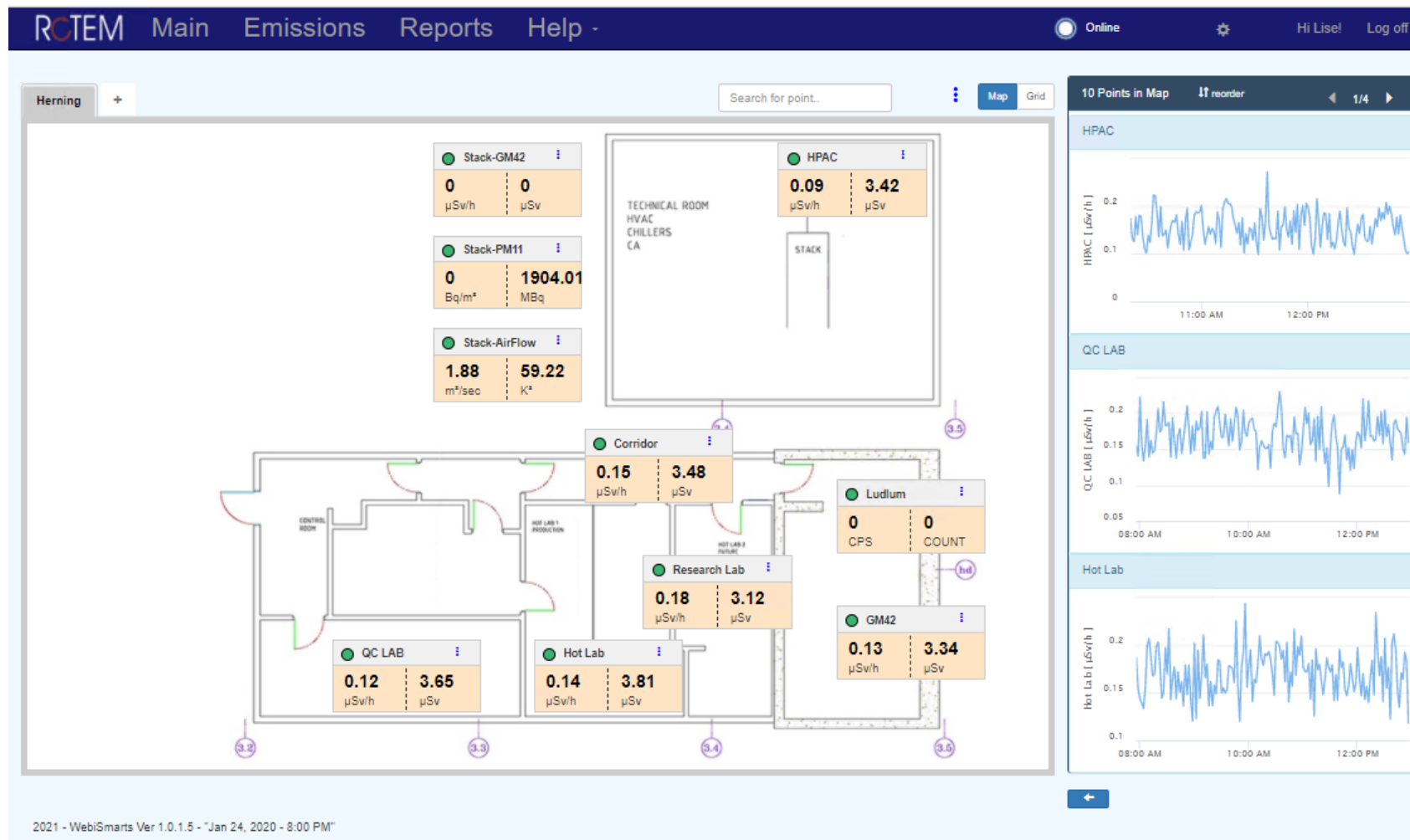
WebiSmarts Software



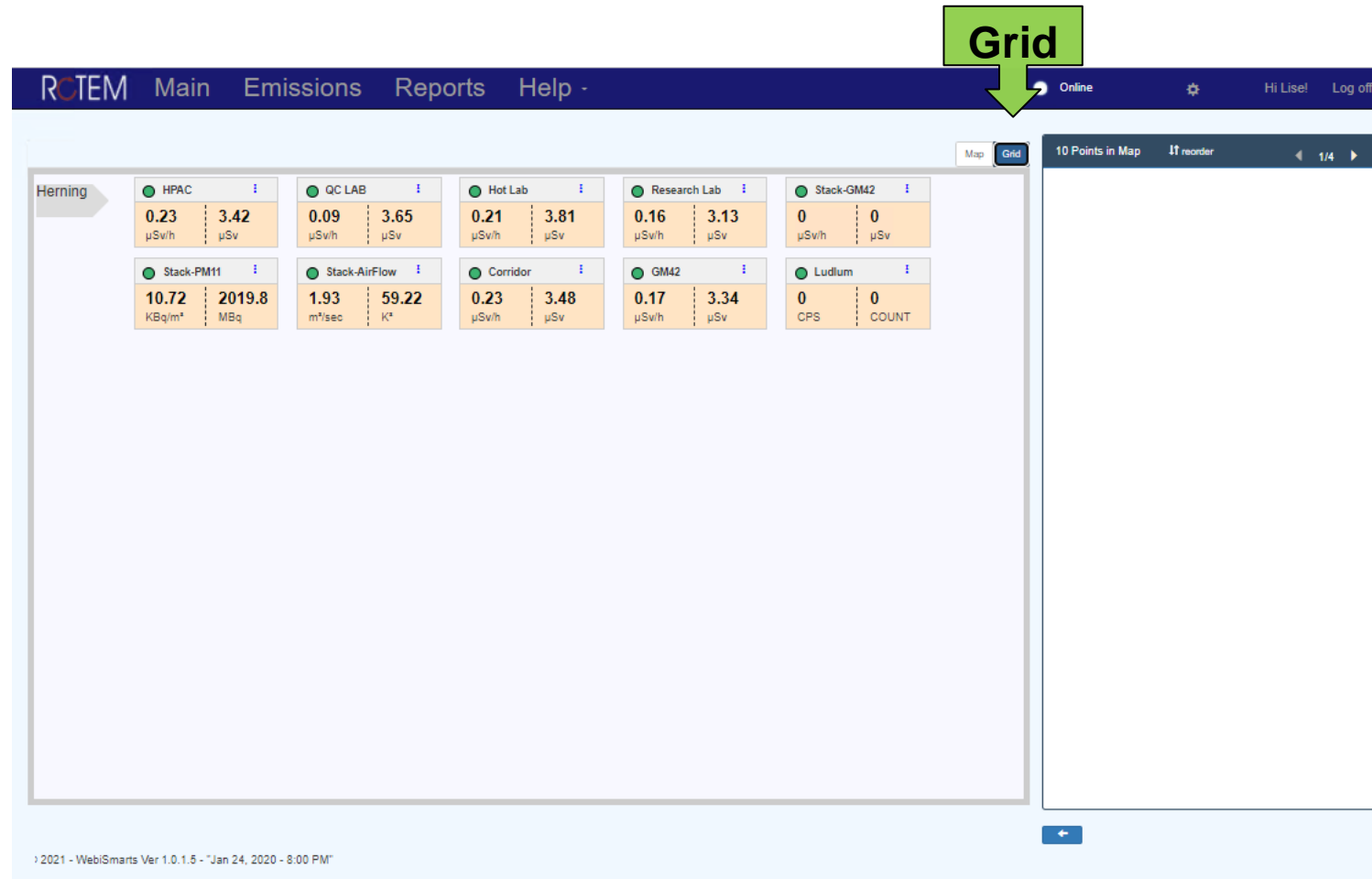
WebiSmarts Features

- Intuitive, ergonomic multilingual controls
- Web based cross platform clients, compatible with all browsers
- Password controlled access to protect sensitive parameters
- Compatible to all tablets running Win10/Win11
- Option MAP or GRID View
- Display filters of all measuring units (dose rate, dose, activity, concentration, flow rate, temperature, humidity..)
- Display of up to 5 graphs simultaneously
- Accumulation of up to one year of data with full zooming capabilities
- Capability to import previous version archives into the new database

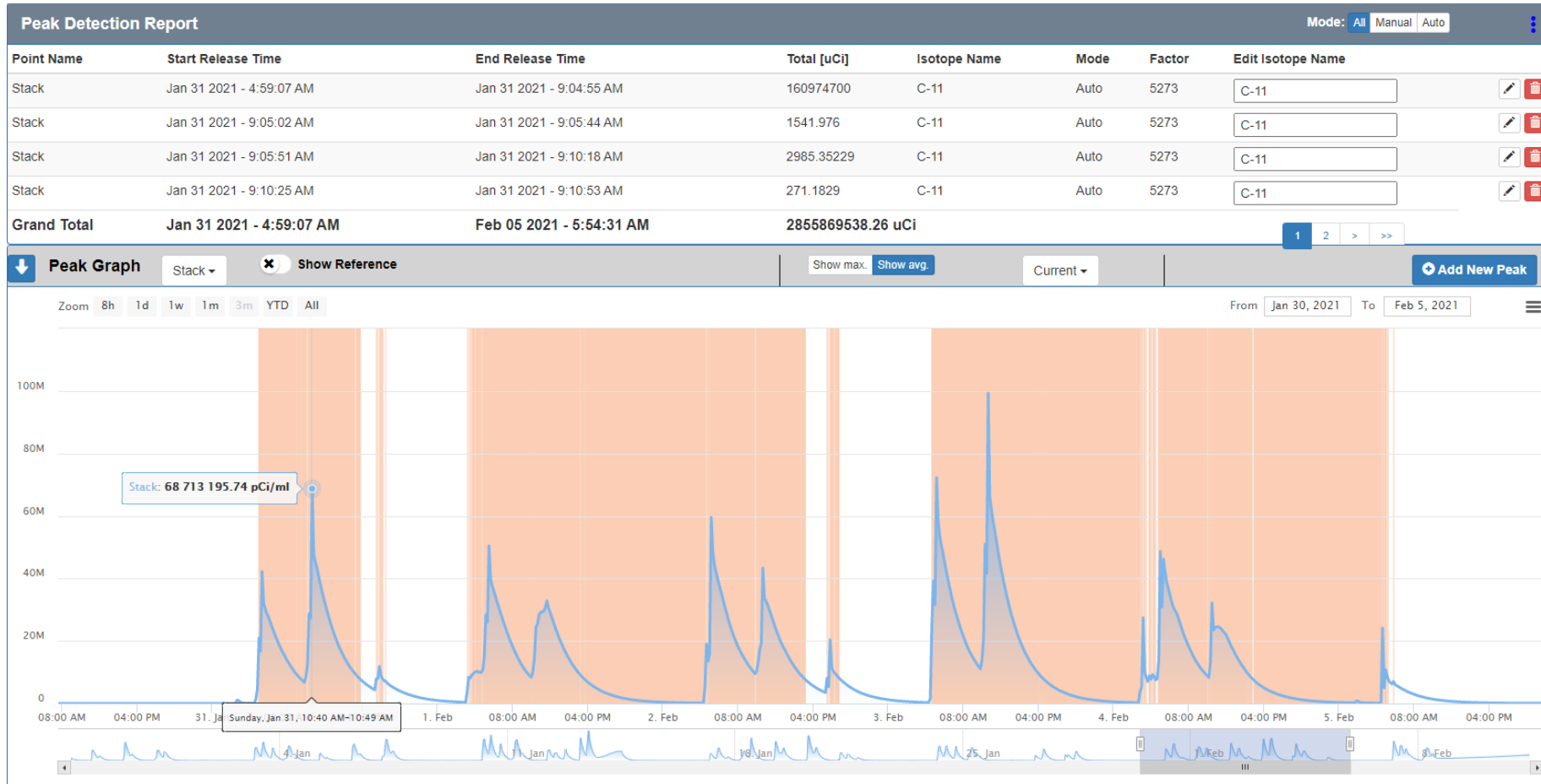
Main



Main



Emissions



Reports

Reports

Logs

Search For

History Events ▾

Malfunction

10 checked ▾

✓ Check All

✗ Uncheck All

✓ Low Rate Alert

✓ High Rate Alert

✓ High Rate Alarm

✓ Danger Alarm

✓ High Dose Alarm

✓ Lost Contact

✓ Reconstructed Lost Contact

✓ Det Fail

✓ Over Flow

✓ Peak Detected

Search

Reports

Name	Description	Start Time	End Time	Status
Stack-PM11	point description	Apr 28 2021 - 12:05:45 PM	Apr 28 2021 - 12:05:53 PM	High Rate A
Stack-PM11	point description	Apr 28 2021 - 12:05:53 PM	Apr 28 2021 - 12:05:55 PM	High Rate A
Stack-PM11	point description	Apr 28 2021 - 12:07:07 PM	Apr 28 2021 - 12:07:14 PM	High Rate Alert
Stack-PM11	point description	Apr 28 2021 - 12:07:15 PM	Apr 28 2021 - 12:07:18 PM	High Rate Alarm
Stack-PM11	point description	Apr 28 2021 - 12:07:16 PM	Apr 28 2021 - 12:07:18 PM	High Rate Alarm
Stack-PM11	point description	Apr 28 2021 - 12:07:18 PM	Apr 28 2021 - 12:07:30 PM	High Rate Alert
Stack-PM11	point description	Apr 28 2021 - 12:08:42 PM	Apr 28 2021 - 12:08:50 PM	High Rate Alert
Stack-PM11	point description	Apr 28 2021 - 12:10:49 PM	Apr 28 2021 - 12:10:53 PM	High Rate Alarm
Stack-PM11	point description	Apr 28 2021 - 12:10:53 PM	Apr 28 2021 - 12:10:59 PM	High Rate Alert
Stack-PM11	point description	Apr 28 2021 - 12:11:05 PM	Apr 28 2021 - 12:11:11 PM	High Rate Alert
Stack-PM11	point description	Apr 28 2021 - 12:13:04 PM	Apr 28 2021 - 12:13:12 PM	High Rate Alarm
Stack-PM11	point description	Apr 28 2021 - 12:13:12 PM	Apr 28 2021 - 12:13:20 PM	High Rate Alert
Stack-PM11	point description	Apr 28 2021 - 12:13:54 PM	Apr 28 2021 - 12:13:58 PM	High Rate Alarm
Stack-PM11	point description	Apr 28 2021 - 12:13:58 PM	Apr 28 2021 - 12:14:01 PM	High Rate Alert
Stack-AirFlow	point description	May 19 2021 - 9:53:00 AM	May 19 2021 - 11:44:20 AM	Lost Contact

<< < 1 2 3 4 5

Export To CSV

Save as PDF

Reconstruct Lost Contacts

The Settings Screen

System Settings

PointsActivity Units: Cl BqMeasuring Units: Inch Metric

Threshold Colors

LowNormalAlertAlarmDangerFailLost Cont.

Reset To Defaults

General

☒ Enable Audio☐ Stop blinking☐ Notification by Email☐ Minimized Mode☐ option to add

Points

New Device

Name	Detector #	Reset Dose Interval	Factor	Flow Channel	Background Channel	Show Dose	Rate Units	Dose Units	Lost Contact Interval	Alert Delay	Enable Scan	Enable Alarm	Pin Point	Point Type	Detector Type	Is Stack
HyperLink	000000	24	1	0	0	false			60	0	false	false	false	0		false
HPAC	0	24	1	0	0	true	µSv/h	µSv	60	0	true	false	false	0	Internal	false
QC LAB	0	24	1	0	0	true	µSv/h	µSv	60	0	true	false	false	0	Internal	false
Hot Lab	0	24	1	0	0	true	µSv/h	µSv	60	0	true	false	false	0	Internal	false
Research Lab	0	24	1	0	0	true	µSv/h	µSv	60	0	true	false	false	0	Internal	false
Stack-GM42	1	24	1	0	0	true	µSv/h	µSv	60	0	true	false	false	0	GM-42	false

1 2 > >>

Users Management

New User

Name	Role
Lise	Admin
Admin2020	User

The Settings Screen

Edit Point : HyperLink

Point Id: 1

Name: HyperLink

Point Description: Hyper Link To Map

Detector: Point Detector Type

Detector #: 000000

Connection Id: 1

Address: 10.65.116.7:5000 [Apply All](#)

Reset Dose Interval [Hours]: 24 [Apply All](#)

Next Reset: 18-December-2020 09:37

Is Stack: ☒ [Apply All](#)

Danger Threshold (): 0000000000 [Apply All](#)

Alarm Threshold (): 0000000000 [Apply All](#)

Alert Threshold (): 0000000000 [Apply All](#)

Low Threshold (): 0000000000 [Apply All](#)

High Dose Threshold (): 0000000000 [Apply All](#)

High Dose Delay [sec]: 0 [Apply All](#)

Conversion Factor (Bq/m³): 1 [Apply All](#)

Background Channel: Select Channel - [Apply All](#)

Air Flow: Select Channel - [Apply All](#)

Fix Flow: 1 [Apply All](#)

Cross Section: 1 [Apply All](#)

Point Type: NGama [Apply All](#)

Display Dose: ☒ [Apply All](#)

Rate Units: Point Rate Units

Dose Units: Point Dose Units

Lost Contact Interval: 60 [Apply All](#)

Min Range: 0 [Apply All](#)

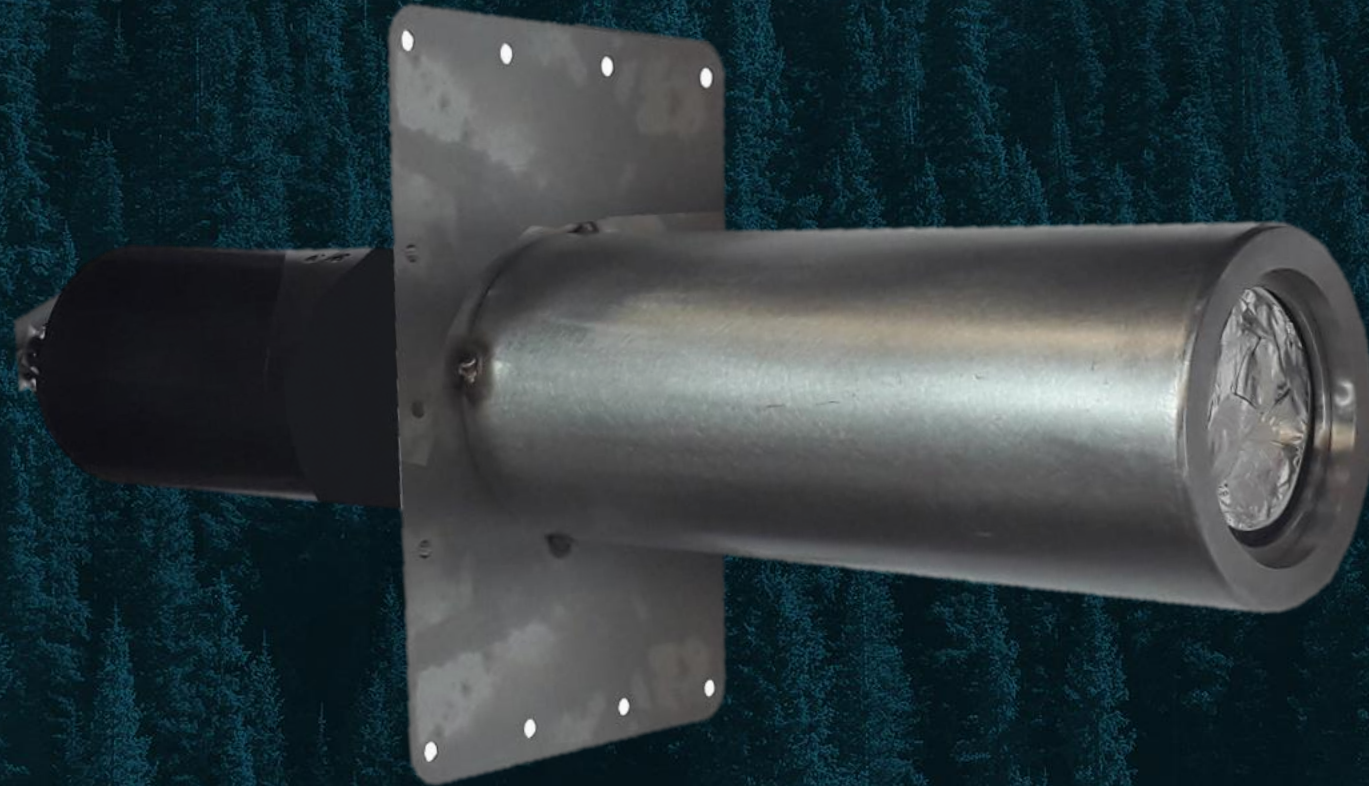
Max Range: 0 [Apply All](#)

Enable Scan: ☒ [Apply All](#)

Enable Audio: ☒ [Apply All](#)

[Update](#) [Close](#)

Coincidence Exhaust Stack Monitor



Coincidence Exhaust Stack Monitor

A standard system includes 3 Detectors:

PM-11 Extremely sensitive 2 x 2" Na(Tl) Detector

Measuring Range: 1,850 Bq/m³ to 5.55E+09 Bq/m³ (0.05mCi/m³ to 150mCi/m³)

GM-42 Sensitive GM Tube based Detector

Measuring Range: 0.1 µSv/h to 10 mSv/h (10 µR/h to 1 R/h)

Flow Meter measuring flow rate of effluent

Measuring Range: 0 to 15 m/sec (0 to 50 ft/sec)

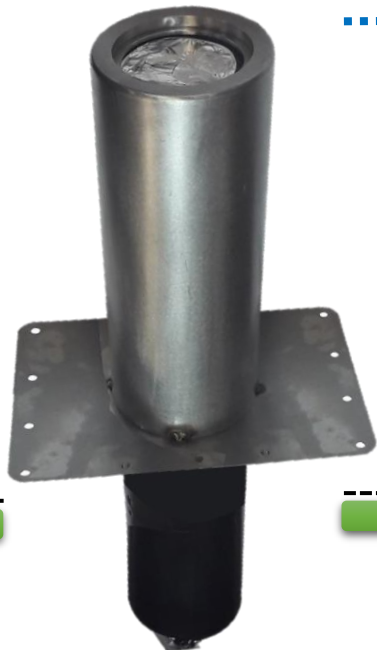
The GM-42 Detector is used to backup the extremely sensitive PM-11 Detector which will saturate at 50,000 cps (around 25 µSv/h or 2.5 mR/h for F-18)

Both Gamma detectors are connected to the Flow Meter in the WebiSmarts Software to provide live data in terms of Concentration (Bq/m³ or pCi/ml) and Activity (Bq/Ci).



Upcoming PM-11 Coincidence Detector

Effluent
air



The coincidence detector detects only activity within the stack



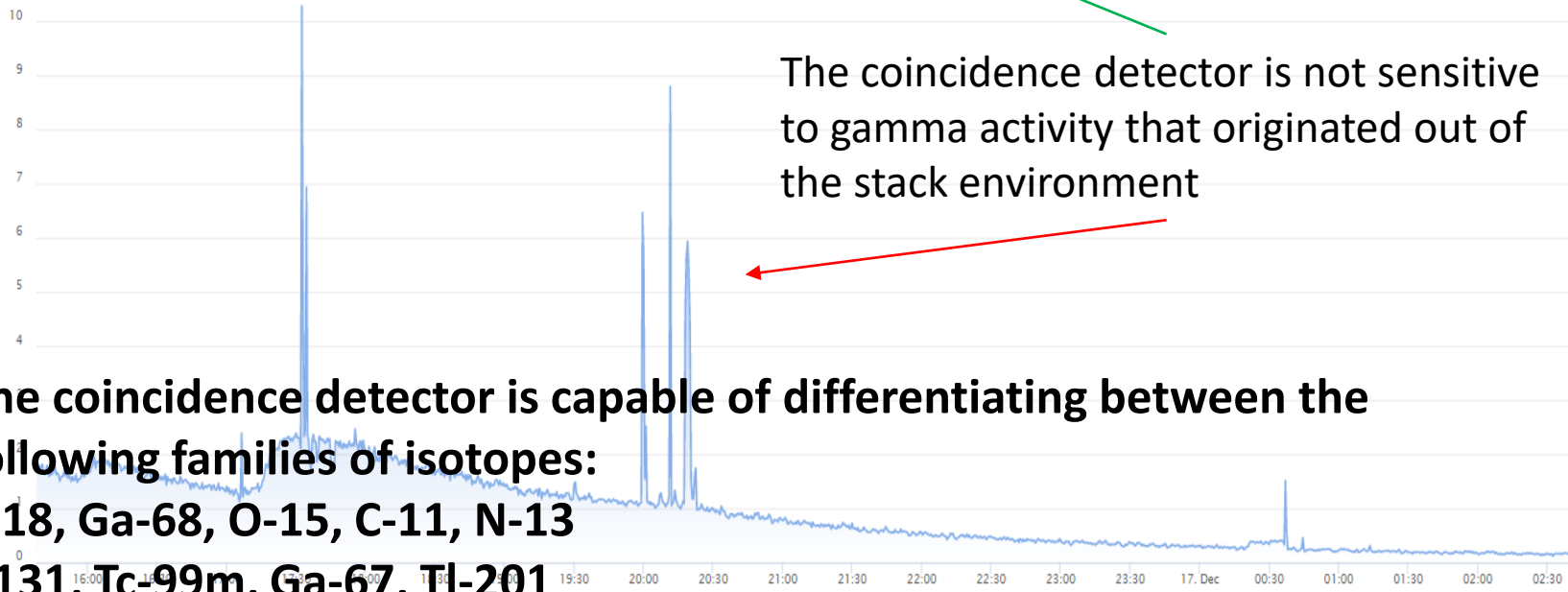
The coincidence detector is not sensitive to gamma activity that originated out of the stack environment

The coincidence detector is capable of differentiating between the following families of isotopes:

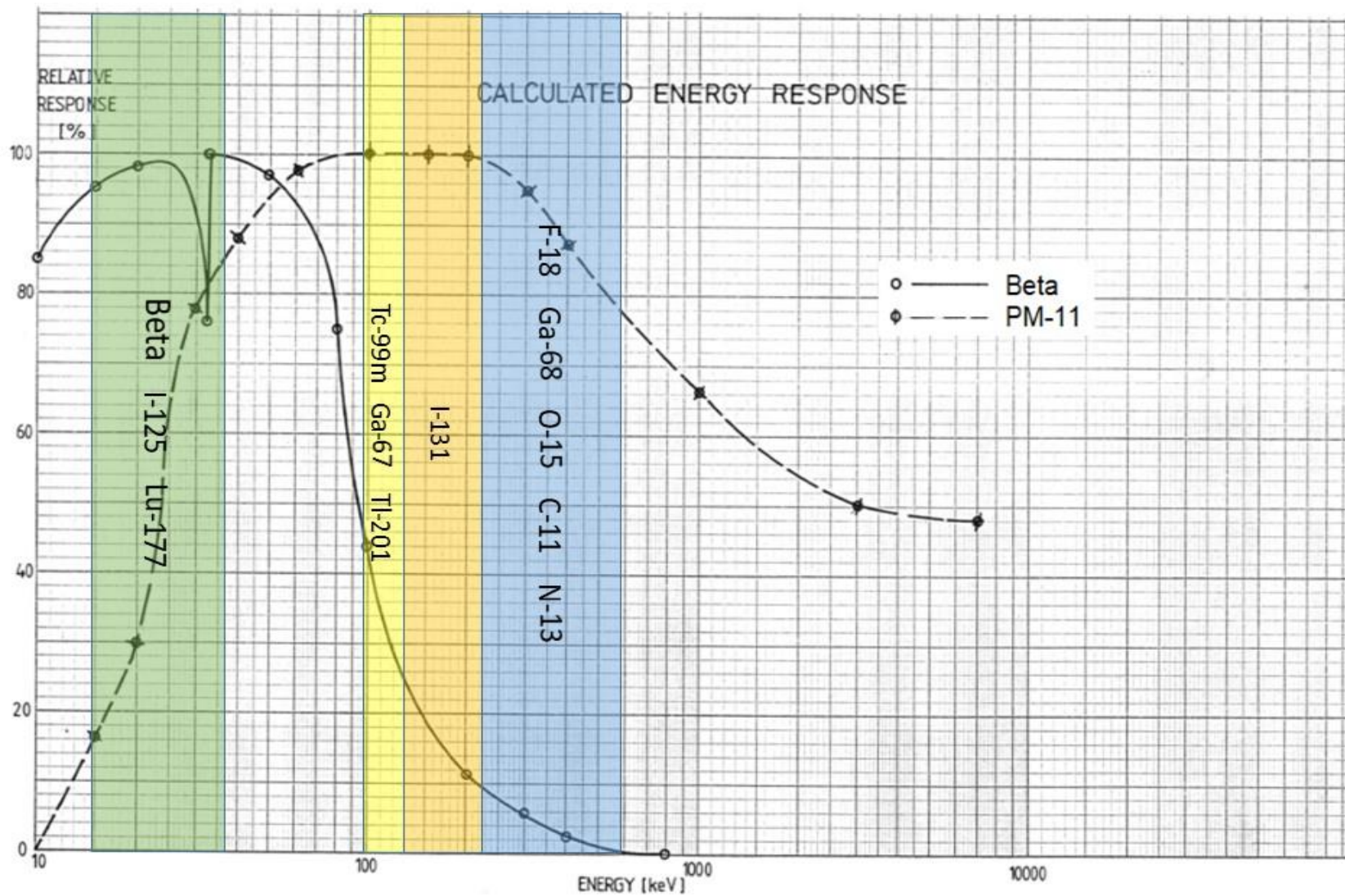
F-18, Ga-68, O-15, C-11, N-13

I-131, Tc-99m, Ga-67, Tl-201

I-125 and Lu-177

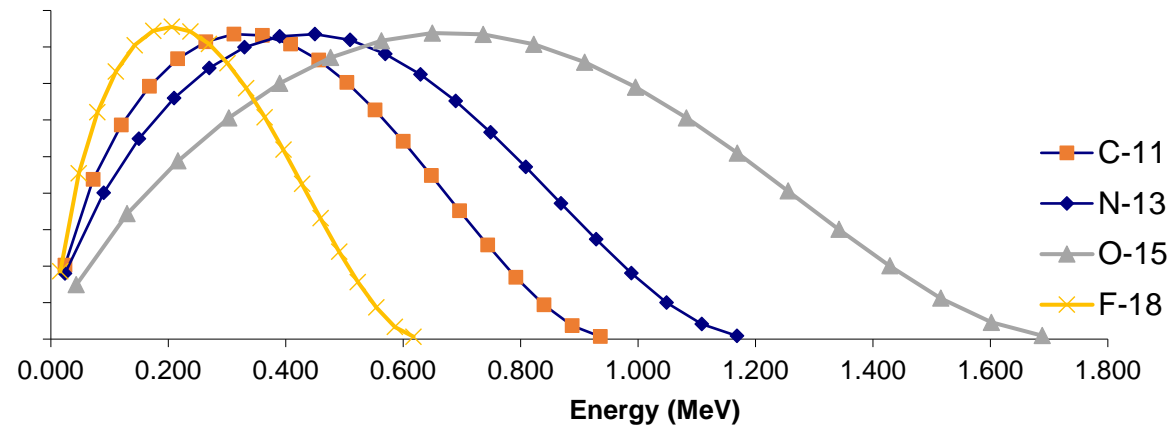


Upcoming PM-11 Energy Windows











SPD – Smart Positron Detector

Normalized positron energy spectra of main PET nuclides



Rotem's SPD is capable of differentiating between the PET nuclides by the signature of the maximum positron energy

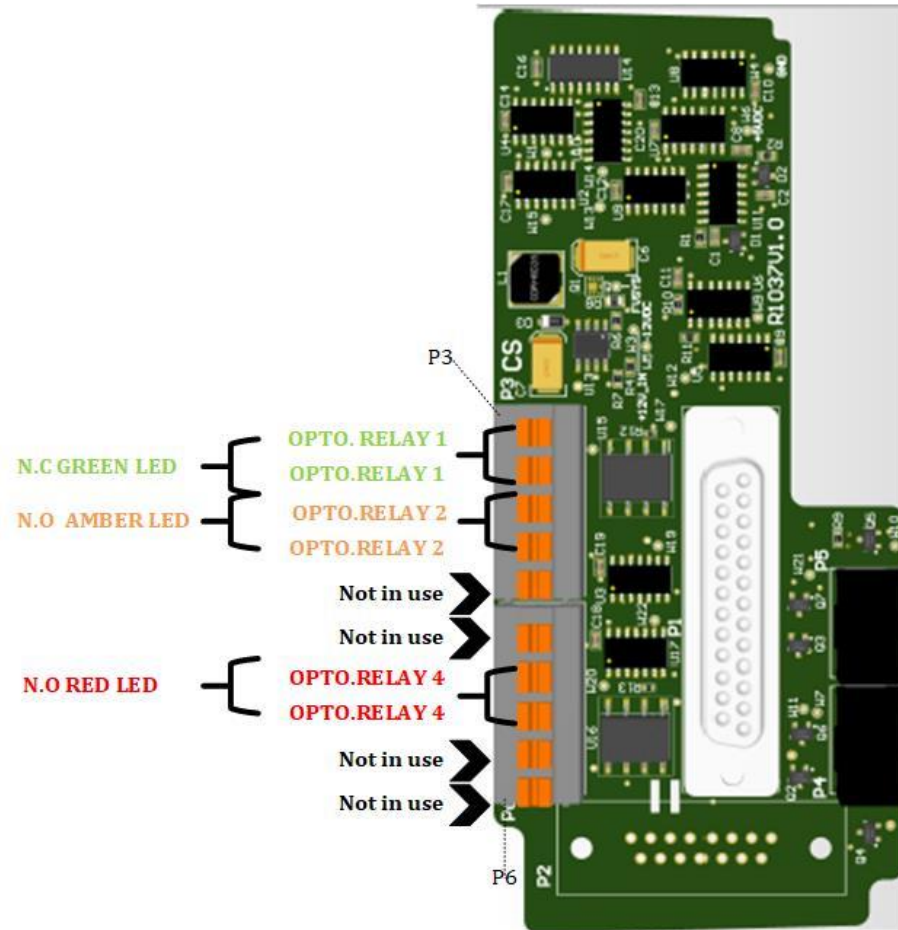
The identified isotope will appear in the WebiSmarts' Peaks review report and an appropriate conversion factor will be applied to calculate the released activity.

Peak Detection Report							Mode: All Manual Auto
Point Name	Start Release Time	End Release Time	Total	Isotope	Mode	Factor	
Bunker	Mar 14 2019 - 16:42:54	Mar 14 2019 - 20:15:53	25	C - 11	Manual	0	 
Bunker	Mar 15 2019 - 02:07:32	Mar 15 2019 - 06:20:09	23	N - 13	Manual	0	 
Bunker	Mar 15 2019 - 07:34:26	Mar 15 2019 - 10:32:45	25.5	F - 18	Manual	0	 
Bunker	Mar 18 2019 - 01:56:38	Mar 18 2019 - 07:44:10	24.5	F - 18	Manual	0	 
Grand Total	null	Mar 18 2019 - 07:44:10	98 uCi				

Peripherals



Remote Detector Bracket



Light Tower



External Signal Interface

Ethernet based solenoid bank.

Receives signal directly from DPU-3

Programmed via RMVC Software

