



Lab
Impex
Systems

PET GUARD RADIATION MONITORING SYSTEM



'PET Guard'

Radiation Monitoring System for PET (Cyclotron) Facilities

The Lab Impex Systems 'PET Guard' provides cyclotron facilities with a total monitoring solution for personnel protection and radioactive emissions.

Being solution based, the systems are designed and configured to meet the needs of the individual facility as well as adhere with the regulatory guidelines.

PET Guard generally consists of stack monitoring system to accurately measure the amount of activity that is being discharged; area monitoring for detection both positron and Gamma radiation in areas such as the cyclotron room, radio-pharmacy, QC lab, dispensing area, patient waiting area, scanner room, public areas near the facility etc.

The monitors are networked back to a central control system, the 9205-PET, an alarm and data management system, data is presented typically by way of a floor plan of the facility with icons defining the location of each of the radiation detectors. The colour and shape of the icon defines the real time status condition of each of the monitors. Should an alarm be activated, this will be identified on the control system as well as the local monitor where the incident has occurred.

All data is archived and can be retrieved for historical review. In line with the local regulations the system will also calculate and display in real time the status of the activity discharged from the facility, this is reported with daily, weekly, monthly and annual results. This information can be easily exported into reports in readiness for regulator inspection.

High reliability, flexibility and versatility have been key to the development of Lab Impex Systems PET Guard, thus allowing clients to expand or upgrade their systems with the minimum of disruption or expense.

The future; Lab Impex constantly strive to run a programme of improvements to our systems, PET Guard is no exception, we plan to bring a number of ongoing enhancements to the system to ensure that our customers not only have the best PET Monitoring Systems in the world but additionally can see benefit on their balance sheets.



reliability flexibility versatility

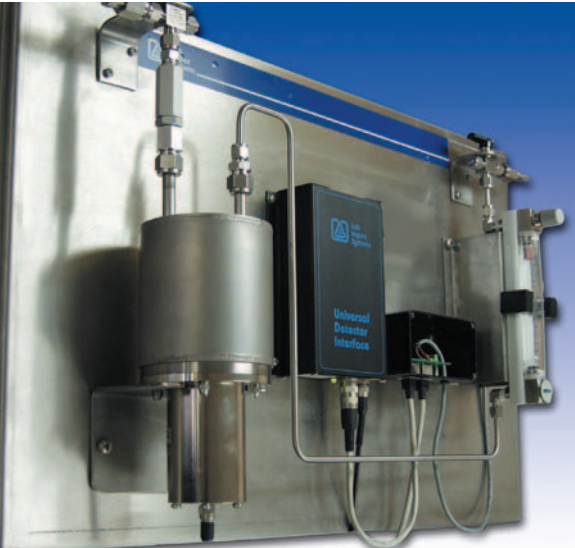
Continuous Monitoring Station CMS

The Continuous Monitoring Station (CMS-PET) is the basis of Lab Impex PET Guard Systems. Using the latest in state-of-the-art technology, the easy to use menu driven display enables intuitive access to configure and operate the monitor easily. It provides enhanced communications, including as standard RS485/RS232 and TCP/IP web enabled interfaces and is fully compatible with previous LIS CMS generations. An optional internal battery supports the system should the mains power supply be lost.

As with previous CMS generations, the principle behind the design is to create a platform familiar to the user. The innovative, flexible, CMS range of instrumentation is a tried and tested system operating in numerous nuclear and industrial establishments throughout Europe, the USA and the rest of the World.



Gamma and Gaseous Monitoring



The PG-10 Positron Gas Detector is an advanced sensor for the accurate, sensitive measurement of PET radionuclide gas concentration. A culmination of over 15 years research and operation in PET facilities, the PG-10 is a unique solution offering unparalleled performance in terms of detectable limit, accuracy and range of operation.

The PG-10 provides real operational benefits. The thin plastic scintillant ensures an efficient response to positron emissions in the chamber, but possesses a very low inherent background and minimal response to 511 KeV gammas, which can be highly beneficial if the system is located near to stack filters or other sources of background. Furthermore the system is small, compact and easily installed and serviced.

The detector has shown stable long term performance in many facilities around the world and is recognised as the most accurate, sensitive system commercially available.

It is necessary to have reliable, fast response monitoring in radio-pharmacy, hot cells, patient areas and sometimes public access areas. The CMS range is able to support a wide range of detectors such as GM, Ion Chambers and Scintillation detectors as required. These detectors can be mounted up to 200 metres away without requiring additional amplification.

Typical Ranges

GM1/324 Compensated GM 0.1 μ Sv/h - 100mSv/h
(0.01mrem/h - 10rem/h)

GM1/314 Compensated GM 10 μ Sv/h - 3Sv/h
(1mrem/h - 300rem/h)

Stack Monitoring and Flow Measurement

The Lab Impex PET Stack Monitoring System is designed to provide the client with the best mix in terms of operational needs and possible future requirements.

The key design criterion of the system has been:-

- To offer instrumentation with fail safe characteristics
- To maximise sensitivity and accuracy of effluent emission measurement in terms of flow and concentration
- To simplify instrument calibration and system maintenance
- To provide result data and reporting facilities in a form to aid and assist the licensor and the licensee
- To offer full expansion opportunities in the future (i.e. additional gamma measurement points and/or gaseous area monitors)

Lab Impex Systems offer a range of flow measurement devices to accurately measure stack flow and are the only system supplier to offer a complete solution of in-house manufactured stack radiation and stack flow sensors.



9205-PET Alarm and Data Management System

The 9205-PET Alarm and Data Management System is connected to the facility's radiation monitors, it provides a real time status monitoring of the facility and archives this data for future retrieval and reporting.

The Continuous Monitoring Stations (CMS-PET) can be configured to locally generate high intensity audible and visual alarms on the following:-

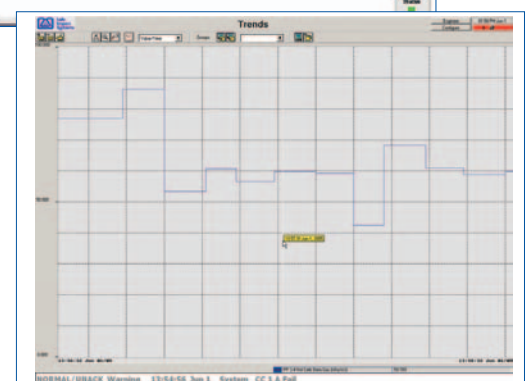
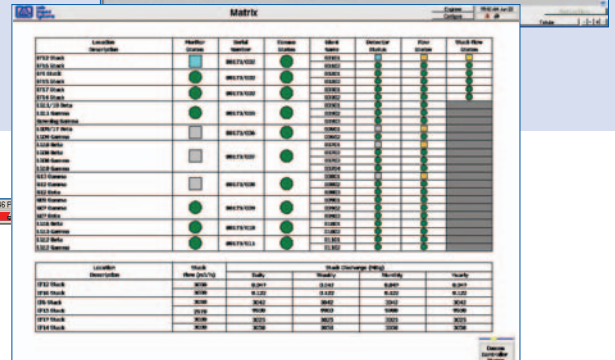
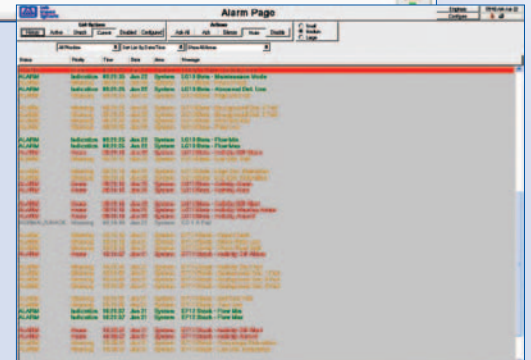
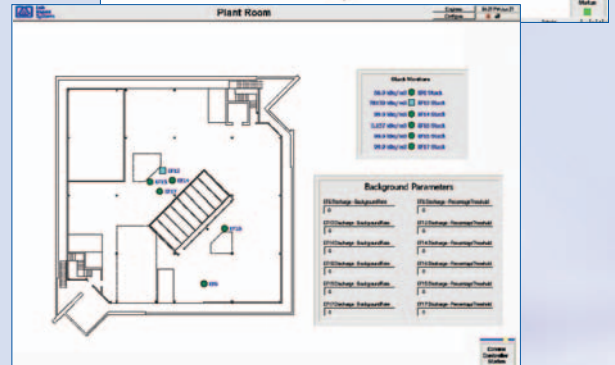
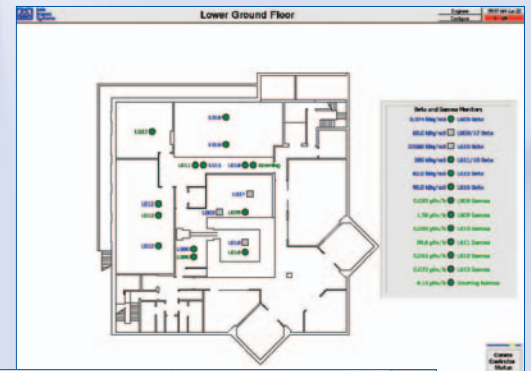
- High Concentration of Positron Gas ($\mu\text{Ci/ml}$)
- Detector Failure
- Low Sample Flow (blockage or pump failure)
- Low Stack Flow (blockage or fan failure)

These signals are transmitted from the CMS, via an RS-232/RS-485/TCP/IP connection back to the central control PC running the 9205 PET-software.

Real time status and historical data is displayed on the screen inclusive of:-

- Aerial Discharge
- Facility Plan
- Status Matrix
- Alarm Status
- Historic Data (Trend/Tabular)

The system also supports export of data to excel or access files, used for generating regulatory reports, multiple user access modes and data archiving. The option of accessing the data across Intranet or the Internet using a web browser is also available.



Top Systems Matrix Engineer (1:45 P) Configure

Location Description	Monitor Status	Serial Number	Comms Status	Ident Name	Detector Status	Stack Flow Status
GM 1.1 Cyclotron Room Gamma	▲	B0173/002	●	G0101	▲	
GM 1.2 Technical Room Gamma	●		G0102	●		
GM 2.1 Production Units Gamma	●		G0201	●		
GM 2.3 Reception Area Gamma	●	B0173/002	●	G0202	●	
GM 2.4 QC Lab Gamma	●		G0203	●		
PP 3.4 Hot Cells Beta Gas	●		B0301	●	▲	
PP 3.1 QC Beta Gas	▲	B0173/002	●	B0302	●	
PP 3.2 Cyclotron Room Beta Gas	●		B0303	●		
PP 3.3 Production Units Beta Gas	●		B0304	●		

Stack flow (m3/h)	Stack Discharge Totals (MBq)			
	Daily	Weekly	Monthly	Yearly
5490	1,209	6,342	19,07	137.9

Comms Controller Status

Menu Ground Floor Matrix Alarm Page Trends Tabular

PET Guard Training, Service and Calibration

All PET Guard Systems are manufactured, tested and serviced by LIS personnel with vast experience in the field of radiation monitoring. LIS is committed to providing high quality after-sales service to our customers for all of our products. We pride ourselves in knowing that, when supplying you with one of our products, we will provide you, the customer, with an unrivalled level of reliability, quality and first-class service and support.

Lab Impex Systems has a dedicated team of engineers with the knowledge that ensures that you fully benefit from our service, calibration and repair facilities. With offices and nominated representatives geographically located to minimise response time, LIS are able to provide fast, reliable, effective response regardless of your location, worldwide.

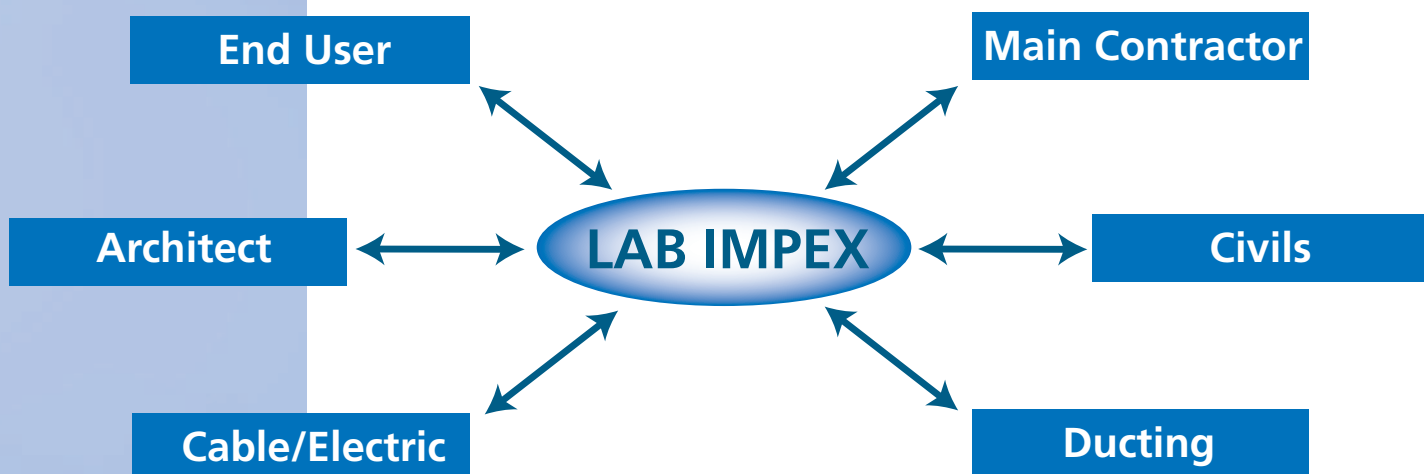
Our service and support activities include installation, commissioning and training. We offer tailored service and maintenance contracts, extended warranties and our engineers may be called up 24 hours a day to ensure fast, efficient response and minimum downtime.

As a direct result of our comprehensive range of services and support the Lab Impex aim is to ensure that you gain and retain maximum performance from our products throughout their lifetime. LIS offers added confidence that all our work is undertaken under the umbrella of BS EN ISO 9001:2000 Quality Management System.

Project Management

Lab Impex Systems provides internal project management to ensure contracts are managed in a timely and professional manner. We believe that by defining the processes to our customers at the beginning of the project, time can be saved and errors prevented.

We will offer a start up meeting which can take place at the customer's nominated site or at our facility. Following this, all future meetings requested by the Customer, unless otherwise specified in the contract, shall take place at the LIS (or nominated representative's) facility. A site survey visit is covered within standard offers, to ensure all works necessary to enable installation have been carried out to specification.



Founded in 1976 Lab Impex Systems is a leader in the development and supply of radiation detection equipment and integrated nucleonic systems. As suppliers to Defence, Nuclear, Medical and Industrial customers worldwide, we have superior expertise and knowledge in providing solutions that provide reliability, ease of use and what is seen as a key benefit in today's markets - 'Value for Money'.

Lab Impex can offer inclusive consultation on design, provision of complete systems, installation, commission and post operative service support.

Tailoring systems to meet the specific needs of the Defence, Nuclear and Medical sectors is a major part of Lab Impex's business. With the challenges within these markets now set before us we believe having the skills, knowledge and flexible instrumentation to provide compliant and cost effective solutions provides our customers with peace of mind.



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