

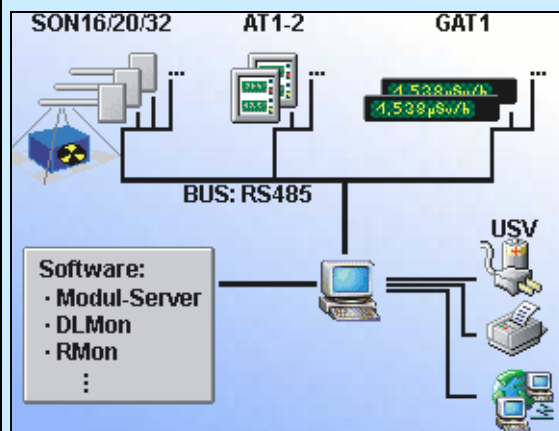
Radiation Monitoring System DLMon

Fields of Application:

- Dose rate monitoring system for use in nuclear medicine
- Area monitoring (e.g. manufacturing of radionuclides, laboratories, nuclear power plants, or storage facilities of radioactive materials)

Features:

- Custom-oriented measuring system consisting of intelligent radiation detectors and displays (up to 255 single elements).
- Analysis software based on advanced Client-Server-Concept (custom-designed analysis of acquired data)

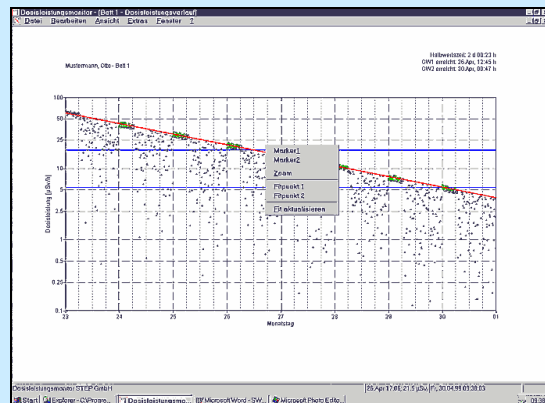
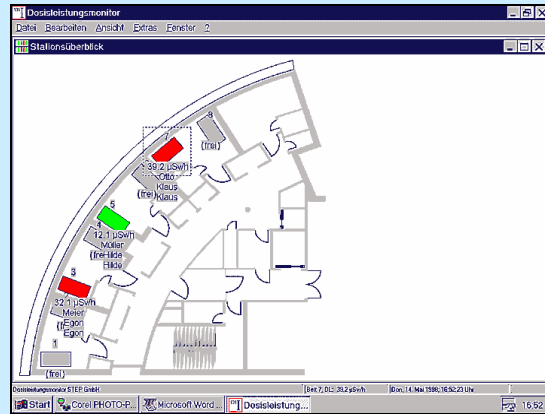


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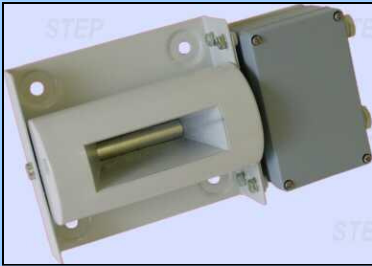
System - Components:

- intelligent detector with internal micro-controller
- intelligent single and double displays with internal micro-controller and selectable thresholds
- intelligent large-scale displays with special features
- data acquisition and processing unit (consisting of computer, printer, no-break power supply and RS-485 interface)
- Client-Server-Software (operating system: Windows NT, 2000)




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<p style="text-align: center;"><u>Intelligent radiation Detector:</u></p> <p style="text-align: center;"><u>SON16</u></p>	
<p>Measuring value:</p>	<p>Photon dose equivalent rate or ambient dose equivalent rate</p>
<p>Detector:</p>	<p>Geiger-Muller tube Typ 70004</p>
<p>Measurement range:</p>	<p>1 $\mu\text{Sv/h}^*$... 500 $\mu\text{Sv/h}$ <small>* (Measurement time 200 s, Measurement uncertainty < 3 %)</small></p>
<p>Energy range:</p>	<p>35 keV ... 1.3 MeV</p>
<p>Collimator:</p>	<p>Material: Lead Acceptance angle: $\pm 30^\circ$</p>
<p>Electronics:</p>	<ul style="list-style-type: none"> • micro-controller with internal memory • 128-kByte-Flash-EEPROM • data transfer by RS-485 interface • calculation of dose rate from counting rate • correction for detector dead time and background counting rate • data memory (up to 9088) values including date and time in a non-volatile cyclic memory • acquisition parameters (acquisition time, number of cycles) can be defined • continuous self-monitoring of all internal and external operating voltages; • functional tests of the detectors, interfaces and memories

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<p style="text-align: center;"><u>Intelligent radiation Detector:</u></p> <p style="text-align: center;"><u>SON20</u></p>	
<p>Measuring value:</p>	<p>Photon dose equivalent rate or ambient dose equivalent rate</p>
<p>Detectors:</p>	<p>Geiger-Muller tube Typ 70013E (*)</p>
<p>Measurement range:</p>	<p>0.5 $\mu\text{Sv/h}^*$... 200 $\mu\text{Sv/h}$ <small>* (Measurement time 200 s, Measurement uncertainty < 3 %)</small></p>
<p>Energy range:</p>	<p>35 KeV ... 1.3 MeV</p>
<p>Collimator:</p>	<p>none</p>
<p>Electronics:</p>	<ul style="list-style-type: none"> • micro-controller with internal memory • 128-kByte-Flash-EPROM • data transfer by RS-485 interface • calculation of dose rate from counting rate • correction for detector dead time and background counting rate • data memory (up to 9088) values including date and time in a non-volatile cyclic memory • acquisition parameters (acquisition time, number of cycles) can be defined • continuous self-monitoring of all internal and external operating voltages; • functional tests of the detectors, interfaces and memories

(*) The Type SON20 is available in versions with different GM-Tubes and several measurement ranges.

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Intelligenter exhaust air monitor:

AL 2000



Description:

The system AL 2000 is designed for exhaust air monitoring during handling of gaseous radionuclides. Three highly-sensitive proportional counters - arranged within a 5 cm lead shielding – measure the background and airborne radioactivity separately. Data acquisition and processing is computer-controlled.

Dimensions (L x W x H):

560 mm x 510 mm x 630 mm

Weight:

600 kg

Measuring values:

Activity concentration Bq/m³

Measuring Unit:

Detectors:	3 Xe-filled proportional counters RXD 1000
Window:	1000cm ² , 15µm titanium foil
Volume:	5 l, gas inlet and outlet with separate gas distribution chamber

Shielding:

Lead, 5 cm

Functional Check:

external check source

Electronics:

- micro-controller with internal memory
- 128-kByte-Flash-EPROM
- data transfer by RS-485 interface
- calculation of dose rate from counting rate
- correction for detector dead time and background counting rate
- data memory (up to 9088) values including date and time in a non-volatile cyclic memory
- acquisition parameters (acquisition time, number of cycles) can be defined
- continuous self-monitoring of all internal and external operating voltages;
- functional tests of the detectors, interfaces and memories

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Intelligent display unit:

AT1 - 1

AT1 - 2



Single display for each detector or double display for two detectors, resp.

Display of the measuring value:

- 3 1/2 - digit display (height of digits: 17.8 mm), LCD with backlighting
- quasi-analogue bar graph (20 elements)
- optical and acoustic error signalling (reset by software)
- 3 LED (red, yellow, green) for rapid signalling of the health risk for staff (respective thresholds can be chosen separately for each display)
- data transfer by RS-485 interface
- EPROM for data storage

Electronics:

- micro-controller with internal memory
- 128-kByte-Flash-EPROM
- data transfer by RS-485 interface
- data memory (up to 9088) values including date and time in a non-volatile cyclic memory
- internal functional tests

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Software – Module

Server-Software:

- Local server, automatic data-acquisition from detector and data-transfer to display
- Automatic monitoring of all bus components
- Fault-tolerant data acquisition
- Automatic data back-up
- Providing data for various client-software

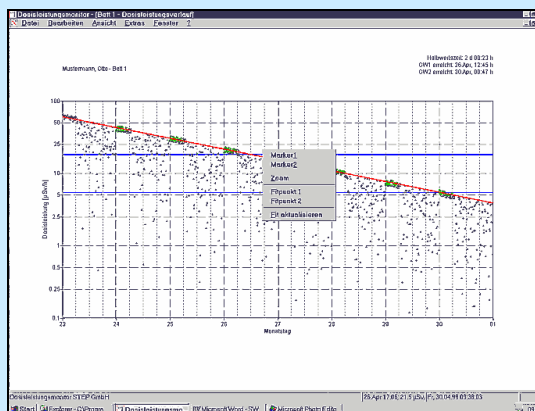
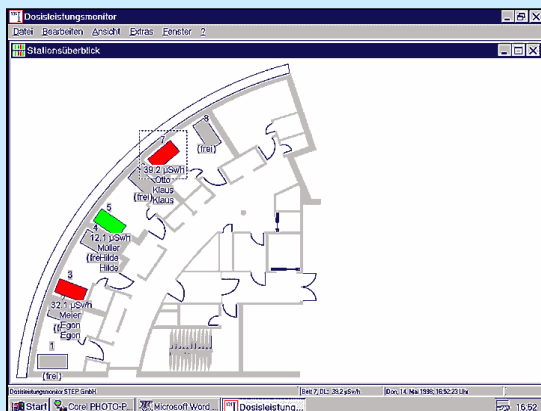
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DLMon-client-software:

Analysis software for patient monitoring for use in radioiodine therapy.

- Display of the arrangement of each detector in the rooms to be monitored
- Detector overview: display of the current dose rate digitally as well as by a colour code
- Dose rate histogram
- Long-term archiving of acquired data
- Detector calibration
- Automatic monitoring of all components and functions
- Marginal check: if pre-selected thresholds are exceeded - emission of warning signals and/or activation of safety facilities
- Patient check-in (optional: chip-card reader)
- Patient data base
- Histograms including the display of discharge-thresholds (user programmable)
- Data fit to estimate the effective half-life of the incorporated nuclide
- Transfer of patients by mouse-click
- Printing forms for patient discharge
- Drawing up reports on chosen periods



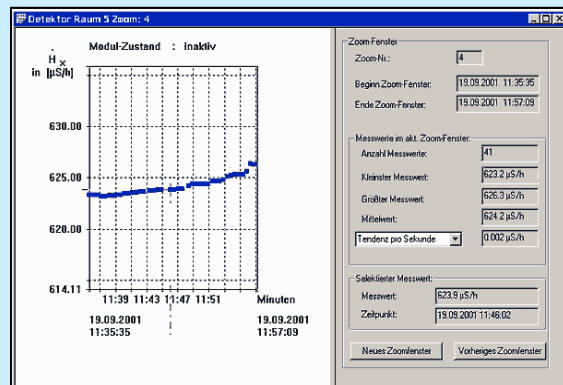
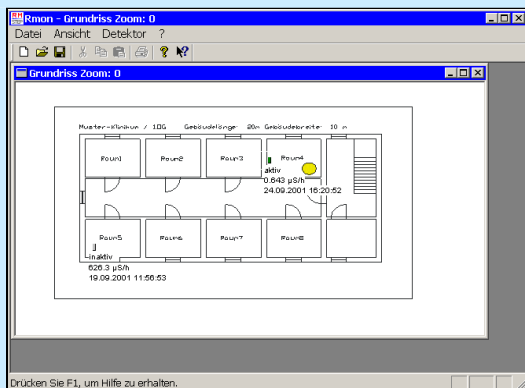
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RMon-client -software:

Analysis software for room monitoring for use in laboratories and exposed rooms.

- Display of the arrangement of each detector in the rooms to be monitored
- Detector overview: display of the current dose rate digitally as well as by a colour code
- Dose rate histograms
- Detector calibration
- Marginal check: if pre-selected thresholds are exceeded-emission of warning signals and/or activation of safety facilities



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