LOW LEVEL RADIATION MONITOR

TYPE NXG_LRM

Technical Data

Features :

- Uses SoC, based on ARM Cortex A5 400MHz ,1.5MB SRAM,128MB Flash,extensive use of peripheral devices & Ethernet interface has been employed.
- Uses Microcontroller for counting radiation pulses, fault diagnostics setting HV etc.
- Dose rate range covered is (1- 10000) µR/hr by default, with option of selection of other three 'units' namely µSv/hr, CPS & CPM.
- Auto ranging & auto TC selection in the range of 30 sec to 0.5 sec depending upon detector count rate.
- 5" TFT display indication for dose rate,alarm status & configuration settings.
- Designed using GM tube type LND 7807 or its equivalent.
- Large size WINDOW indication on TFT display for NORMAL & ACTIVE alarm condition.
- Alarm setpoint ACK / RST through touchscreen.

LOW LEVEL RADIATION MONITOR type NXG_LRM, manufactured & supplied by NUCLEONIX SYSTEMS is primarily designed to indicate dose rates in the measuring unit selected & produces audio / visual alarms, if the dose rate exceeds preset value. By default the unit is set to be in µR/hr & the range is (1- 10000µR/hr).It uses latest state-of-art electronic devices including SoC based on ARM cortex A5 400MHz CPU with associated peripheral devices and other discrete ICs & components. Use of these devices makes it compact & highly reliable. Powerful embedded code adds-up and enhances its performance and gives extra advantage from the angle of fault diagnostics, programmable features & measurement of dose rate & data communication under networked environment.

This LOW LEVEL RADIATION MONITOR type NXG_LRM will be useful for monitoring Low Gamma dose rate levels in µR/hr working areas of Radio Isotope Laboratories, Radiotheraphy departments, Medical & Industrial Radiological installations apart from its usefulness in Atomic Power Stations, radiochemical plants, waste immobilization plants etc.,

With power ON, initialization of SoC, peripheral devices, 5" TFT display/timers, counter etc, takes place. Followed by this, dose rate calculation takes place in the selected unit such as µR/hr. Additionally, hardware & fault diagnostic check will be carried out. Display updating will take place every 1 sec. Time constant (TC) for doserate will be computed depending upon the detector output count rate.

LOW LEVEL RADIATION MONITOR NXG_LRM indicates dose rate digitally on TFT display. There are a visual annunciator window GREEN & RED for NORMAL & ACTIVE conditions respectively, shown on TFT display.The entire screen flashes when the dose rate alarm occurs and in normal condition the NORMAL window glows.

For NXG_LRM, User interface is through Radgrid Software by using Ethernet Communication, Multiple Units can be networked.

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Radiation to be detected :
Gamma Radiation & X- Rays.

Range :
1 –10000 µR/hr
0.01 - 100 µSv/hr
0- 50000 CPM
Range and Unit are configurable.

Detector : Energy compensated Halogen-quenched G. M. Tube LND7807 or equivalent having a sensitivity of 160 cps / mR/ hr .

Energy response : +/-25% from 100keV upto 1.25MeV.

Accuracy : +/ - 10% Full scale with Cesium source.

EHT :400 V to 700 V DC adjustable (Typical 500V) (factory set).

Display : 5"TFT is used for display of doserate, hardware status information & also for visualization of preset alarm and other parameters.

Overload : Senses overload above 200% of fullscale and upto 1 R/h & indicates on display "OFL"

Over-range : Senses if the radiation field being measured has exceeded the measurement range of the instrument and upto 200% of the instrument and displays "OVR".

Time Constant : First Stable reading on Power ON within 1 min.

Normal (Slow) : 30 sec to 0.5 sec automatically varying inversely with the radiation level.

Abrupt detection : Update the current reading within 2 sec.

Calibration Accuracy : +/- 10% through out the range.

Alarm range :
1µR/hr r to 9999µR/hr
0.01 µSv/Hr to 99µSv/hr.
1-50000 CPM .

The alarm level setting will be carried out through Radgrid Software by Ethernet Communication.

Alarm Indication :

a) Red Mimic flashing large area on TFT display.
b) Loud alternating audio tone (Dual frequency tone)

Alarm annunciation scheme
As tabulated below :

Parameter Status	Visual indication (Red MIMIC)	Audio
Normal	OFF	OFF
Abnormal	Flashing	ON
On ACK	Steady Red	OFF
Back to normal	Steady Red	OFF
Reset on abnormal	Steady Red	OFF
Reset on normal	OFF	OFF

Instrument Controls :

a) Acknowledgement icon for muting audio alarm.
b) Reset icon for resetting the Alarm indication and alarm relay.

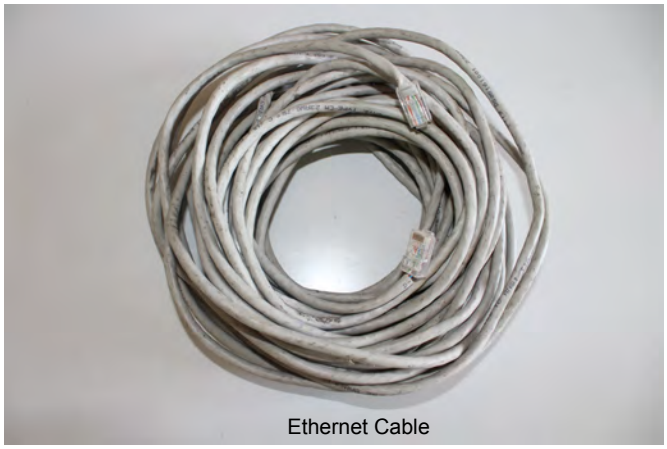
Instrument Fault indication : HV failure : Visual alarm with flashing red MIMIC indication & "HV failure" message on display.

Detector failure : Visual alarm with flashing red MIMIC & "Detector Failure" message on display. Fault indications shall be cleared automatically if normal status is resumed.

Detector Housing: (In case of External Probe)

a. The Probe is located external to the Display Unit.
b. It is housed in a suitable, air-tight SS shell .
c. The instrument is provided with 10 mtr cable between Smart Probe and the monitor.
d. The detector housing qualifies ingress protection Class IP-54.
e. A separate mounting bracket for detector housing is provided.


24 port Ethernet Switch


Ethernet Cable

External Console:

RJ 45 connector for Ethernet port (NXG_LRM)

Computer Interface : The monitor NXG_LRM has a Ethernet 10/100Mbps port for interfacing with a remote Windows PC. The features supported by Ethernet port given below.

- The PC and the NXG_LRM unit shall operate in a Client/Server configuration and the software(RADGRID) protocol will be TCP.
- The PC software shall give commands and send queries. The NXG_LRM unit will carry out various functions in response to the queries.

The firmware of the monitor shall be able to send the instrument data like instrument IP, instrument type, input range, display range, alarm settings, alarm status, current reading, diagnostic status of EHT/GM tube etc. to the Host PC on demand.

- The firmware shall be able to receive commands from Host PC and carry out the setting of different parameters like instrument IP, instrument type, input range, display range, alarm settings, Ack, Reset, instrument address etc.
- It can store data for every second. Last 60 Days data will be in store in the Instrument.

Input Power : 230V AC +/-10%, 50Hz supply.

Mechanical Enclosure:
Size: 270L x 185H x 90D.
Weight: 4Kg approx.

Ordering Info:

Part No	Key Features
NXG_LRM	LOW LEVEL RADIATION MONITOR with Ethernet Port, Networkable works with Radgrid Software for configuration, Remote display of data every sec, Remote ACK & RESET from Radgrid Software etc.
NXG_LRM_Housing	IP 54 outdoor SS housing with transparent window.
Eth_Switch_12 or Eth_Switch_24	12 or 24 port Ethernet Switch.
Eth_Cable	UL approved CAT6 Ethernet Cable.
Eth_Cable laying	Laying & Networking of Ethernet Cable as per site requirements.
Remote & External Console	• 4-20 mA linear proportional to full scale display output. Current output will be able to drive load of 600 ohms. Output circuitry will be able to drive 200mtrs. of twisted pair of wires. • Two sets of potential free contacts of Alarm relay (Change over). Contact rating 3 Amp at 250 VAC. The relay is energized on normal condition and de-energised under alarm condition. • Remote alarm acknowledgment and reset signals for the field instruments (normally open contact). • The monitor will have a RS485 port for interfacing with a remote IBM PC-compatible computer. All these signals are terminated on a 17pin MS connector
SW_RADGRID	PC Software based on LAN that networks multiple NXG Series Radiation instruments of Nucleonix make & display the Radiation data, fault diagnostics, Calibration due etc .