

## Ludlum 2241-2 Radiation Survey Meter Video Transcript

This step-by-step video instructs you on the set up and proper use of the Ludlum 2241-2 meter.

The Ludlum 2241-2 is a meter used for detecting alpha, beta and gamma radiation in radiation area surveys and contamination surveys.

You should begin by familiarizing yourself with the Ludlum and all its parts.

### LUDLUM METER CONTROLS AND FUNCTIONS

The Ludlum 2241-2 includes a side mounted check source and two probes: a tubular sodium iodide probe and a pancake probe.

The 44-2 tubular sodium iodide probe is intended to be used to search for gamma radiation. When using this probe the meter reads in microroentgens per hour ( $\mu\text{R/hr}$ ), milliroentgens per hour ( $\text{mR/hr}$ ), and roentgens per hour ( $\text{R/hr}$ ). This reading is shown on the liquid crystal display (LCD).

The 44-9 is a low range contamination detector, better known as the pancake probe. It detects alpha, beta and gamma radiation. It is intended to be used for contamination surveys. When using this probe, the meter reads in counts per minute (cpm) to kilo counts per minute (kC/m). This reading is shown on the LCD display.

This meter has a three position selector switch:

- off position
- ratemeter
- scaler position

Next to it is the locking toggle switch marked with a 1 (red dot); and with a 2 (yellow dot) for detector selection depending on which probe is being used.

Above the toggle switch is the audio on and off switch.

Next to the audio switch is the fast / slow (FS) speed switch.

Down below you will find a LCD light button and reset button.

At the top of the meter you will find the LCD display. The display has a number of important alarms to be aware of.

The first alarm level is indicated by the word **"ALERT"** on the display. This shows at counts of 20 kilo counts per minute (kC/m) or 20 microroentgens ( $\mu\text{R/hr}$ ) depending on the probe being used.

The second alarm level is indicated by the word **"ALARM"** and the emitting of a continuous alarm tone over the speaker. This shows counts of 50 kilo counts per minute (kC/m) or 50 microroentgens per hour ( $\mu\text{R/hr}$ ) depending on the probe being used.

The unit also displays a count overflow visual alarm. When an overflow is detected, the word **“OFLOW”** will appear. This indicates the incoming count of exposure exceeding the unit’s capability to display a stable reliable measurement.

It is important that you watch for these alarms when using the instrument.

Now, let's set up the meter.

### **METER SET UP INSTRUCTIONS**

- Turn the meter off before performing any of the following steps.
- Inspect the meter, cable, and probe for damage or wear. If damaged, **do not use** the meter.
- Check calibration date on calibration sticker; or calibration certificate. If out of date, **do not use** the meter.
- Open the battery lid and insert two “D” size batteries. To prevent damage to the unit, match the battery polarity to the markers molded into the meter under the lid. Then close the lid.

### **SET UP INSTRUCTIONS FOR THE 44-9 PANCAKE PROBE**

- For a contamination survey, attach the cable to the pancake probe and the meter. Connectors require one quarter turn to right to tighten.
- Ensure the kit number on the probe and the meter are the same. Do not interchange probes with other meters.
- Remove red plastic cover from the pancake probe, if it is attached.
- Lift probe selector switch out of locking position and set probe switch to 1 (red dot). Double check red dot on probe.
- Set speed switch to fast.
- Turn on the speaker.
- Set on/off function switch to ratemeter.
- Wait 15 seconds for meter to warm up and watch start up routine on the display.
- Open the check source door on the side of the meter.
- Hold the mesh window side of the probe next to the check source. The alarm may sound. Allow the meter to stabilize.
- Ensure that the meter reading agrees with the calibration sticker or calibration certificate. +/- 20% is acceptable.
- Remove probe from check source.
- Close the check source door.
- Press reset to silence alarm and clear meter reading.
- The meter is ready for use.
- When finished, ensure you turn off the meter before disconnecting the probe and the cable.

### **WRITTEN INSTRUCTIONS ON SCREEN**

If the meter doesn’t operate or fails:

- Remove the batteries and replace with new ones.
- Repeat the set up and testing instructions.

- If the meter again fails the second time, put everything back in the case and tag it as broken. Obtain a new meter and start again.
- If the battery light on the LCD display is blinking this indicates you have low batteries

#### **SET UP INSTRUCTIONS FOR THE 44-2 TUBULAR GAMMA PROBE**

- Inspect the tubular sodium iodide probe for any damage or wear. If damaged, **do not use**.
- Attach the cable to the probe and the meter.
- Connectors require one quarter turn to right to tighten.
- Ensure the kit number on the probe and the instrument are the same.
- Do not interchange probes with other meters.
- Set probe switch to 2 (yellow dot).
- Double check yellow dot on probe.
- Set on/off function switch to ratemeter.
- Wait 15 seconds for meter to warm up and watch start up routine on the display.
- Open the check source door on the side of the meter.
- Hold the flat end of the probe opposite the connector against the check source and allow the meter to stabilize. The sensor is in the flat end of the probe.
- Ensure that the meter reading agrees with the calibration sticker or calibration certificate. +/- 20% is acceptable.
- Remove probe from check source.
- Close the check source door.
- Press reset to silence alarm and clear meter reading.
- The meter is ready for use.
- When finished, ensure you turn off the meter before disconnecting the probe and the cable.

#### **BACKGROUND RADIATION LEVELS**

Determine the background radiation level before surveying for contamination.

To take a background radiation level reading, hold the probe you are using at full length of the cable away from the instrument.

Measure the background radiation level for approximately 60 seconds.

Typical background readings in an uncontaminated area are about 40-100 counts per minute (cpm) with the pancake probe or between 15-40 microrentgens per hour ( $\mu\text{R/hr}$ ) with the tubular probe.

#### **WRITTEN ON SCREEN**

If you have any questions about this video, please ask your supervisor. Thank you for your attention.