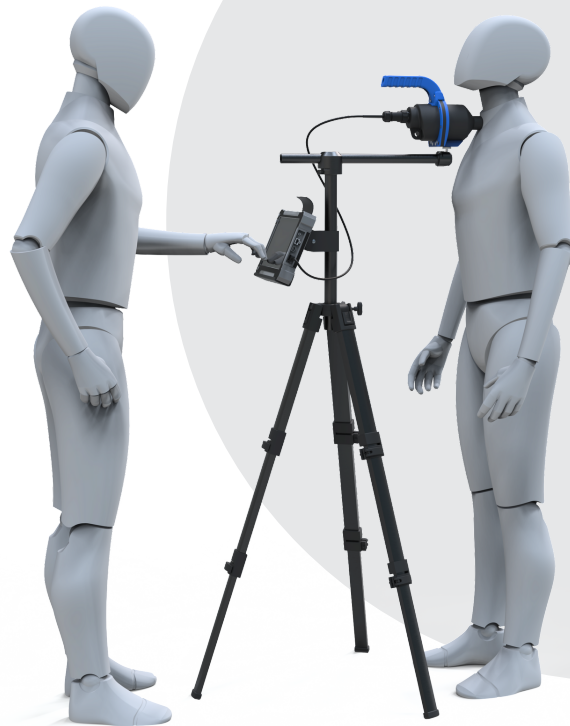


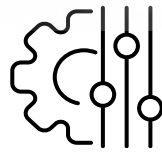


THYMON

PORTABLE THYROID MONITOR FOR EMERGENCY USE



High sensitivity, short measuring time (≤ 2 min)



Mechanical structure designed to ensure setup reliability



Thyroid activity for different age groups

Portable, light-weight, fully-integrated solution

Ruggedness and high IP grade, suited for all weather and environmental conditions

Simple and intuitive user interface

Automatic, advanced, reliable measurement routines

High adaptable and repeatable setup

THYMON is a compact NaI(Tl)-based detector specifically conceived to fast, yet reliably, measure I-131 contamination in thyroid. Its compactness, ruggedness, light-weight, together with its simple and intuitive built-in software interface, make the device perfectly suited for emergency screening applications. The instrument can be used either hand-held or hands-free. The instrument is composed by three main subparts:

- Detector probe: a 1.5" x 1.5" collimated NaI(Tl) crystal coupled to a SiPM matrix and extremely compact readout electronics and MCA
- Extendable support: designed as both table-top and standalone, providing the possibility of hands-free operation
- Control tablet: IP65 water- and dust-proof 8" capacitive screen, wired-connected to the probe

The mechanics of the probe is specifically conceived to ensure the best alignment between the probe and the thyroid, guaranteeing excellent crystal-to-thyroid alignment, and reducing positioning uncertainties.

The control and analysis software installed on the control tablet is designed to be simple and intuitive, yet advanced and comprehensive. This is accomplished by combining a simple and intuitive interface with advanced calculation routines, which run automatically as the measurement start, without the need of operator intervention.

Data are stored locally on the tablet internal memory, and can be analysed and downloaded with dedicated software routines.

The automatic I-131 activity calculation is given for pre-defined age groups: 1 yo, 5 yo, 10 yo, 15 yo (Adult Female), Adult Male. Counts-to-activity conversion coefficients are calculated by dedicated Monte Carlo simulations based on detailed detector and thyroid numerical models. The simulations are always validated for the specific system through experimental tests performed with reference radioactive sources.

The activity is compared to 2 User-defined threshold levels, each defined per each age group, following the two Action Levels logic.

MDA as low as about 100 Bq can be achieved in 2 min screenings. The MDA can be further lowered by enabling the background subtraction option.

TECHNICAL SPECIFICATIONS

Detector probe

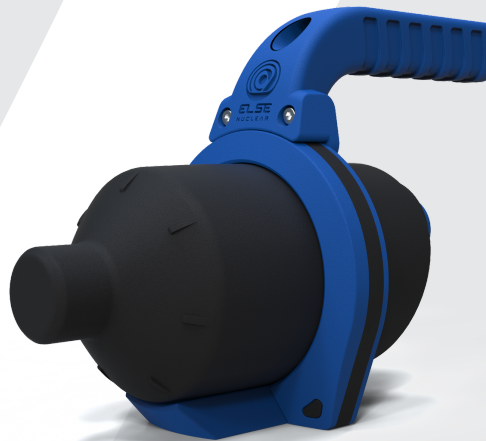
- NaI(Tl) dimension: 1.5" x 1.5"
- Resolution: < 7.5% @ 662 keV
- Lead collimator: 1.5 cm
- Probe weight: 3.5 kg
- MCA: 1024 channel

Control tablet

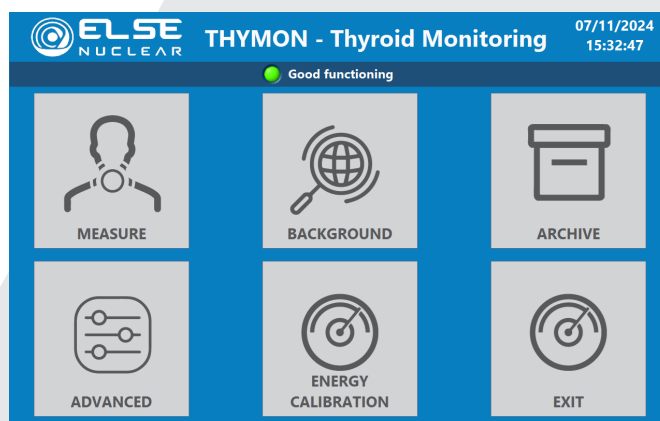
- Dimensions: 225 x 148 x 20.5 mm (screen: 8")
- IP65, waterproof and dustproof
- Suitable to be used with gloves

System performances

- Default age groups: 1yo, 5yo, 10yo, 15yo, Adult Female and Adult Male
- MDA: about 90-120 Bq in 2 min (depending on age)
- Maximum measurable activity: > 3 MBq
- Estimated uncertainty due to positioning: $\leq \pm 20\%$
- No source needed for energy and efficiency calibration



THYMON probe



THYMON software interface

OPTIONS

- Automatic committed effective dose calculation (ICRP 119, ICRP 103) and dose threshold setting (to set Action Levels according to TMT Handbook (*))
- Monte Carlo efficiency curves for custom age groups/measurement classes

(*) TMT handbook, *Triage, Monitoring and Treatment of people exposed to ionising radiation following a malevolent act*, SCK-CEN, NRPA, HPA, STUK, WHO 2009

ACCESSORIES AVAILABLE UPON REQUEST

- Multiple hot swap tablet batteries
- Tablet capacitive stylus
- Rugged IP65 transport case
- Calibration sources
 - Natural potassium salt for periodically quality controls
 - Cs-137 point source, < 10 kBq, for periodically quality control
- Warranty extension from 12 months to 24 months

