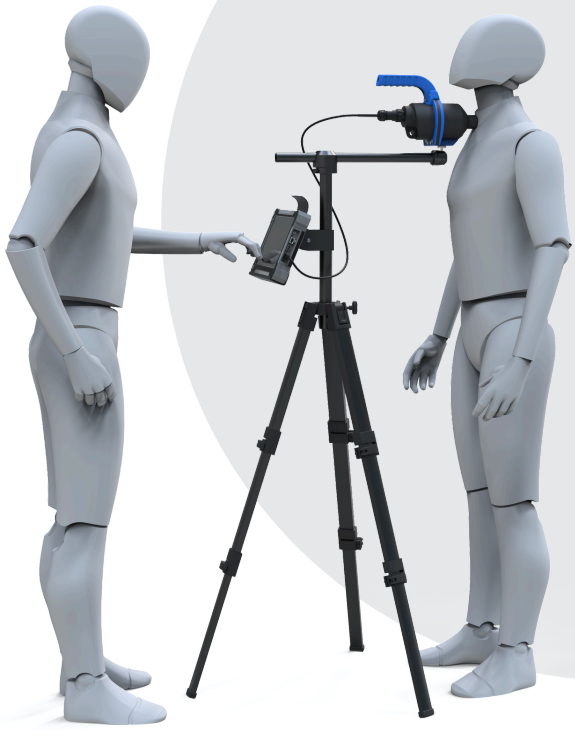
THYMON

PORTABLE THYROID MONITOR FOR EMERGENCY USE



High sensitivity, short measuring time (≤ 2 min)

Engineered for quick and reliable deployment

Age-group-specific response functions

- Portable, light-weight, fully-integrated solution
- Rugged, high IP-rated design for all-weather operation
- Simple and intuitive user interface
- Fully automatic operation designed for non-expert users
- Compliant to IEC 61582

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: rugged, IP65-rated capacitive touchscreen designed for reliable use in harsh environments

The probe mechanics is specifically designed to ensure optimal positioning with respect to the thyroid, guaranteeing excellent detector alignment and minimizing positioning uncertainties.

Intuitive and comprehensive control software integrates advanced automatic calculation routines, requiring no operator intervention. Data are stored locally on the tablet and can be easily reviewed or downloaded for advanced post-processing and analysis.

November 2025 - rev 2

The automatic I-131 activity calculation is given for pre-defined age groups: 1 yo, 5 yo, 10 yo, 15 yo, Adult Female, and Adult Male. Additional age groups can be defined by the User. Counts-to-activity conversion coefficients are calculated by dedicated Monte Carlo simulations based on detailed detector and thyroid numerical models. The instrument response function was validated through experimental measurements using physical age-dependent neck phantoms at CIEMAT. The results demonstrated excellent performance across all age groups and full compliance with IEC 61582 requirements.
The measured activity is compared against two user-defined threshold levels, independently set for each age group, according to the two Action Levels logic.
An MDA as low as about 100 Bq can be achieved in 2-minutes screenings, which can be further lowered enabling the automatic background subtraction.

TECHNICAL SPECIFICATIONS

Detector probe

- NaI(Tl) dimension: 1.5” x 1.5”
- SiPM-based, compact MCA
- Lead collimator thickness: 1.5 cm
- Probe weight: 3.5 kg
- Operative temperature range: -20°C ÷ +50°C

Control tablet

- Compact design with a large touchscreen
- Suitable to be used outdoor and with gloves

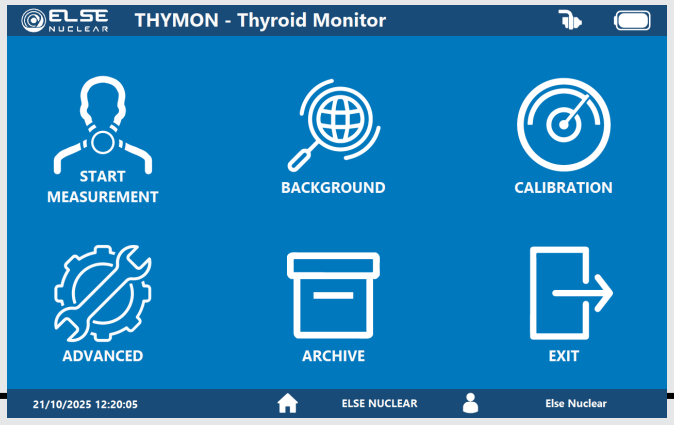
System performances

- Default age groups: 1yo, 5yo, 10yo, 15yo, Adult Female, and Adult Male
- MDA: typically 90–120 Bq in 2-minute screenings
- Maximum measurable activity: > 3 MBq
- Estimated uncertainty due to positioning: ⩽ ±20%
- No source needed for energy and efficiency calibration

Mechanical info and protection rating

- Overall dimensions (case): 62.8 × 49.2 × 22.3 cm
- Total weight: ~19 kg
- IP rating:
  - closed lid, transportation: IP67
  - operative setup: IP65

THYMON probe and storage case



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

- Cs-137 point source, < 10 kBq, for periodical quality control
- Warranty extension from 12 months to 24 months

Operative HQ: Via Sacro Monte 3/12 - 21052 Busto Arsizio, Varese – Italy
+39 0331 620533 - info@elsenuclear.com