

ALFANUCLEAR SYSTEM FOR THYROID UPTAKE

This system, made in Argentina, consists of an integrating spectrometer and a thyroid uptake probe.



A) INTEGRATING SPECTROMETER, MODEL ZXUSB:

ZXusb is an instrument based on a tablet with Windows, portable, with an 8" touchscreen, designed for operations with scintillation detectors. Power is supplied by an external switching adapter for 110–220 Vac, that also charges the battery inside the tablet. This spectrometer may also be used with a well counter.

It includes preamplifier, linear amplifier, digital counter, electronic clock, high voltage source for detector and single channel analyzer for gamma spectrum analysis. All electronics is inside the probe, which connects with the tablet through a single USB cable, eliminating high voltage and coaxial signal cables. All communication between the probe and the tablet is digital. As electronics is inside the probe, the specifications of ZXusb refer to the probe + tablet set.

A digital integrator displays counts per minute (CPM) on screen continuously. Counts received during the last 6 seconds are integrated to calculate CPM. There is also a bar to display CPM graphically (with auto scaling), to make searching for a peak easier.

Channel level, window, high voltage and presets are digitally controlled by touching the screen.

All measurements or only some selected ones can be recorded in a text file, with configurable columns (number of measurement, counts, time, counts per minute, high voltage, channel level and window width). If Wi-Fi is available, recorded measurements will appear automatically in all the other PCs connected with the same OneDrive (Hotmail) account. The text file may be printed directly (with Notepad or similar programs) or inserted in a spreadsheet (Excel or similar).

- **High Voltage:** 25 to 1500 volts, with digital reading. It varies continuously by touching the screen with 1 volt resolution. There is an arch/overcharge alarm that switches off high voltage for safety.
- **Calibration Stability:** less than 0.1 % variation.
- **Digital Voltmeter:** high voltage is measured continuously, with digital reading in volts. It is used also for auto calibration sequence.
- **Digital Thermometer:** temperature inside the probe is measured continuously. Digital display in degrees Celsius.

- **Mains:** 110-220 V ac and rechargeable battery (included). If the power goes out, measurements can continue.
- **Sensitivity:** 100 mV = 100 in level display, with gain x1.
- **Input Impedance:** 100 kOhm.
- **Gain:** x1, x2, x4, x8, x16, x24, x32, x48, x50, selectable by touching the screen.
- **Channel Level:** 0 to 1000 divisions, step 1 division, selectable by touching the screen.
- **Channel Width:** 10, 20, 50, 100 divisions, and D (discriminator), selectable by touching the screen.
- **Count Display:** 8 digits with thousand separators, 0 to 16777215 counts.
- **CPM Display:** 9 digits with thousand separators, 0 to 999999999 cpm.
- **Time Display:** type HH:MM:SS.
- **Count Preset:** 0 to 16777215 counts (if 0 it does not stop by counts), selectable by touching the screen.
- **Time Preset:** 00:00:00 to 23:59:59 (86399 seconds, if 00:00:00 it does not stop by time), selectable by touching the screen. If time and counts are preset, counting stops when the first condition is reached.
- **Operational Temperature:** -15 to 50 degrees Celsius.
- **Linearity:** +/- 10% of true value for the analogical and digital integrator; +/- 2% of true value for the digital counter, high voltage, level and window; +/- 4% for battery reading.
- **Time Constant:** 6 seconds.
- **Connectors:** USB for Thyroid Uptake probe (Type A). Micro-USB for the external charger (Type B). The spectrometer does not need any other power supply.
- **Tablet Specifications:** Intel quad core processor. 2 GB RAM. 32 GB solid state drive. Micro SDHC/SDXC cards support. Wi-Fi 802.11 b/g/n + Bluetooth 3.0. Touch-screen: 8.9". Resolution: 1280 x 800. Battery: Li-polymer, 5600 mAh (autonomy: about 4 hours). QWERTY keyboard, detachable. Front and rear cameras. Internal mic and speakers, connection for external ones. Tablet specifications may change.

B) TABLE TOP THYROID UPTAKE PROBE, MODEL CTM-USB

The CTM-USB consists of a tilting holder and a scintillation detector with a 1" in diameter and 1" thick thallium activated sodium iodide crystal, with a type IAEA (International Atomic Energy Agency) collimator and a suitable lead shielding.

The photomultiplier and the crystal are housed in a metallic probe that contains all the electronics (including the high voltage source). The photomultiplier has a mumetal shielding to avoid interference of Earth's magnetic field.

A single USB cable connects the detector with the tablet. This digital connection reduces the risk of noise to a minimum. The detector has a mini-USB connector where the USB cable is plugged. The cable length is 1.2 m.

One year warranty against manufacturing defects. Bumps and misuse are exempt. This warranty will be executed at Alfanuclear.
