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Low-cost standalone multi-sensor thermometer for long time measurements

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We present a portable device for long-time recording of the temperature at multiple measuring points. Thermocouple wires are utilized as the sensors attached to the objects. To minimize the production cost, the measured voltage signals are amplified and sequentially relayed via a multiplexer to a single microcontroller. The observed temperature and the corresponding date and time, obtained from a real-time clock circuit, are recorded to a memory card for further analysis. The device is powered by a rechargeable battery and placed in a rainproof container, thus it can operate under outdoor conditions. A demonstration of the device usage in a mandarin orange cultivation field of the Royal project, located in the northern Thailand, is illustrated.

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