

USE BLUETOOTH PROTOCOL IN INDUSTRIAL ENVIRONMENT

Abstract: the Bluetooth protocol is heavily used in consumer devices but its use in industrial and professional market is very reduced. Purpose of this document is to weigh the pros and cons in the use of BT in the industrial and professional fields.

The BT and its relative BT low energy, are radio systems operating in the 2.4 GHz band. Normally BT is considered a short range system because used mainly in very short range communications (mobile phone - headset and headphone – hi-fi).

Actually the class 1 devices, with 0,1 W of maximum power, can operate at more than 1 km of distance in open field. In indoor use, the 2.4 GHz frequency, is heavily penalized from walls; we can then reasonably think ranges from 50 to 200 meters in function of quantity and thickness of the walls to cross.

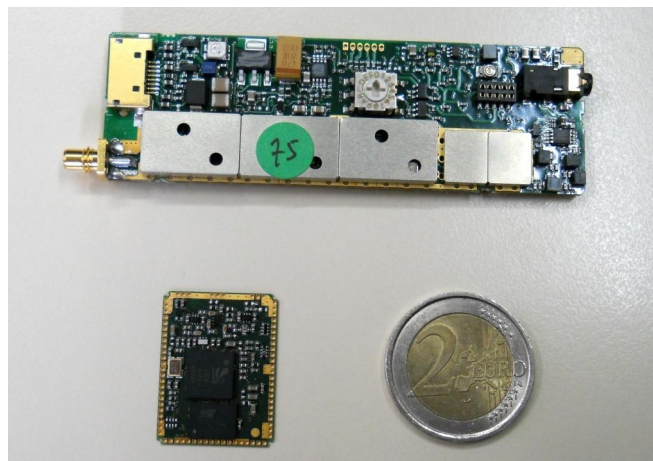
Notwithstanding these limitations, the Bluetooth protocol **is** very interesting because worldwide diffused, therefore does not require different frequency bands for each country, such as the standard LPD (Low Power Devices), which in Europe are at 433.92 MHz, 300 MHz in America and around the world has still different frequency bands.

Other advantages of BT protocol are its robustness, its immunity to interference and its ability to connect directly to the free channels available.

In an industrial environment the BT protocol can therefore be advantageously used in hostile areas in terms of interference (motors, electronic drives, contactors, etc.)

Another important quality of BT is his possibility to cypher the transmitted data with an high security 128 bits AES algorithm.

A very little and low cost electronic board can integrate the functions described with a lot of advantages for miniaturized applications.



In this image we can see the dimensional comparison with a class 1 BT board and the equivalent LPD technology at 433.92 MHz. Dimensions are ≈ 188 ; and the cost... too!

The BT Low Energy, powered by a single lithium coin battery, is able to maintain a functional link for over a year.

Imagine therefore the vast possibilities of application of this protocol:

- in security applications, for example, where remote sensors of an anti-theft system are reliably connected via BT (the BT network can be hidden to normal BT protocol analyzers).
- In agriculture to connect remote sensors up to 1 Km away.
- In industrial environment, where you can connect the various sensors of a factory.



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- In photovoltaic plant, where you can remotely monitor the flow of energy from each individual string of panels, thanks to the low cost of BT.
- In wireless audio conferencing systems and in audio connections that need an encoding for content protection.
- Link in medical systems, for the remotization of patient data.

Redox has developed several projects with the standard BT and is able to route the customer to an approved product at first attempt. It has a large production capacity, with automated test sets for test and calibrations. Contact us for more informations: info@redoxprogetti.it