

Advantages of a license-free radio

- **Quick deployment and cost-effective.** No license required, no operating cost, no contracts
- **Easy to use.** Pre-programmed frequencies make them plug-and-play
- **Global operations!**

Disadvantages of license-free radios

- **Limited range.** Typically license-free frequencies are available on higher frequency bands with lower transmission power, so range is shorter.
- **Interference-sensitive use.** The shared nature of license-free frequencies means that multiple users can operate on the same channel, leading to potential interference and communication disruptions.
- **Not suitable for business-critical nor emergency use cases.** In this type of application, it is always recommended to use licensed frequencies.

When are license-free radios a great fit?

When high availability of communication link does not play a crucial role in the system, for example:

- **Closed environments** like factories or industrial areas, where the network is controlled and isolated
- **Remote locations** with minimal risk of other users in the selected frequency
- **Open outdoor areas** such as agricultural fields, construction sites, or mining areas where medium-range and low infrastructure needs matter
- **Temporary setups**, for example at sports events, outdoor exhibitions, or mobile operations, where quick deployment without licensing is essential

They offer cost-effective, flexible, and rapidly deployable solutions — especially where licensed infrastructure is unnecessary.

Examples of license-free ISM (Industrial, Scientific and Medical) frequencies with SATEL radio modems:

EU, UK, NO, CH, TR: European license-free 869 MHz frequency band

- Medium ranges (some kilometres)
- 869.400 to 869.650 MHz, ≤10% duty-cycle with up to 500mW ERP (**E**ffective **R**adiated **P**ower from the antenna relative to a half-wave dipole in a certain direction). The term **duty cycle** defines the percentage of a 1-hour period a single modem is allowed to transmit. The modem limits the duty cycle itself. Recommendation CEPT/ERC/REC 70-03.

US, CA, AU, NZ, BR: 915 MHz frequency band

- Medium ranges (some kilometres)
- No duty cycle limitations. 902 to 928 MHz, many countries have specific regulations for this FHSS (**F**requency **H**opping **S**pread **S**pectrum) frequency band. When radio modem is ordered with regional limits according to target country, the modem handles the regulatory limits on its own. It is up to the user to handle the EIRP (**E**ffective **I**sotropic **R**adiated **P**ower) limitations according to the regulations (US, CA: max. 4 W EIRP / AU, NZ, BR: max. 1 W EIRP)!

Before deploying any radio equipment, it is crucial to consult the relevant regulatory authorities in your specific location to ensure compliance!