TECHNICAL OVERVIEW

Spider Wireless Protocol

SPIDER: **S**ecure **P**rotocol for **I**nternet **D**evices **E**nabled by **R**adio.

An open, long-range wireless protocol.

Why Spider?

The market is missing an open protocol, flexible enough to elegantly handle both medium and long range, and that's why Seluxit is creating Spider as an open-specification initiative, driven by the Spider Alliance, composed of international companies. WiFi and Bluetooth did it in 2.4 GHz, and now's the time for a sub-GHz equivalent.

Key Features

- PHY / MAC layer specification
- Multi-channel
- Sub-GHz ISM band
- Compliance with all global regulations
- Multiple data rates
- Large packets
- Excellent area coverage and noise tolerance
- State-of-the-art security
- Open specification, driven by the Spider Alliance

Benefits

- Long range and medium range on one chipset
  (variable data rates)
- High throughput
  (multi-channel hopping handles duty-cycle limits)
- You choose higher-layers without modification
  (fragmentation support for larger packets)
- Supports inexpensive transceivers from multiple vendors
  (small maximum packet size)
- Open: no vendor lock-in
  (open specification, hardware compatibility)
- Works globally
  (sub-GHz unlicensed ISM band, regulation compliance)
- Low cost of implementation
  (hardware choice, open specification encouraging competition)
- Lower energy footprint (suitable for battery-operated devices)
  (Sleep mode, wake-on-radio)
- Robust performance
  (multi-channel, synchronization)
- Robust security
  (nonce, forward secrecy, large encryption keys)

Key Specifications

Frequencies	863-870 MHz (EU ISM band) 902-928 MHz (US ISM band) Other regions slated	Authentication / authorization and key-exchange	Diffie Hellman, ECC with large keys
Initially supported data rates	100 kbit / s 10 kbit / s 1 kbit / s	Channel hopping method	Time-constrained, fast, pseudo-random, from fixed list with no intrapacket channel switching
Max. fragment size	256-byte, up to 256 fragments	Max. dwell time	400 ms (FCC regulations)
Max. packet size	65,536 bytes (64 KB)	Collision avoidance	CSMA / CA
Channels	>100	Registration	MAC layer, enabling inclusion-by-proxy by higher network layers
Encryption	CCM using AES with 256-bit keys	Time synchronization support	Based on packet arrival and slot knowledge

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