



Wireless Communication Protocols Comparison Table

Technology	Frequency	Data Rate	Range	Power Usage	Topology	Proprietary	Availability	Fees	
802.11	Wi-Fi	sub-GHz (802.11ah)	up to 346.667 Mbps	up to a km	Medium	Star	Wi-Fi Alliance	Available	Branding Cost
	Wi-Fi 6	2.4 and 5Ghz (802.11ax)	up to 9.607 Gbps	up to 35m (single router)	High	Star	Wi-Fi Alliance	Available	Branding Cost
802.15.1	Bluetooth(802.15.1)	2.4GHz	1,2,3 Mbps	up to 90 m	Low	Piconet and Mesh	Bluetooth SIG	Available	Certification of device under the SIG
802.15.4		868 MHz (EU) /915 MHz (NA)	250 kbps						Certification of device under the alliance
	Zigbee	2.4GHz	250 kbps	up to 90 m	Low	Mesh, Star, Cluster	Zigbee Alliance	Available	
	WirelessHART	2.4GHz	250 kbps	up to 90m	Moderate	Mesh	Hart Communcation Foundation	Available	None
	6LoWPAN	2.4GHz	250 kbps	up to 100m	Moderate	Star		Available	None
	ISA100.11a	2.4GHz	250 kbps	up to 500m	Moderate	Mesh, Star, Cluster		Available	None
	Thread	2.4GHz	250 kbps	up to 30m	Low	Mesh	ThreadGroup	Available	None
Cellular	GPRS	380 to 1900 MHz	128.4 kbps	several kms	High	Star		Limited	None
	EDGE	380 to1900 MHz	355.5 kbps	several kms	High	Star		Limited	None
	3G-HSDPA	700MHz to 3GHz	14.4 Mbps	several kms	High	Star		Available	None
	3G-HDPA+	700MHz to 3GHz	337 Mbps	several kms	High	Star		Available	None
	LTE-Cat1	600MHz to 6GHz	10 Mbps	several kms	Moderate	Star		Available	None
	LTE-CatM1	600MHz to 6GHz	1 Mbps	several kms	Low	Star		Available	None
	NB-IoT	600MHz to 6GHz	250 kbps	several kms	Low	Star		Available	None
	5G	600MHz to 6GHz	20 Gbps	several kms		Star		Future	
			24-86Ghz	20 Gbps	several kms		Star		
Z-wave		868.42MHz (EU) / 908.42MHz (NA)	40 kbps	up to 30m	Low	Mesh	Silicon Labs	Available	Certification of device
LoRaWAN		868.42MHz (EU) / 908.42MHz (NA)	up to 50 kbps	several kms	Low	Star	LoRa Alliance	Available	Certification of device under the alliance
							Semtech		
SigFox		868MHz (EU) /902MHz (NA)	600 bps	up to 800m	Low	Star	SigFox	Available	Certification of device
ISO 18000	NFC	13.56MHz	106 to 424 kbit/s	10cm	Low	P2P	NFC Forum	Available	None
	RFID	125 kHz to 134 kHz; 6.7 MHz; 27MHz;	106 to 424 kbit/s	up to 10 cm	Low			Available	None
		433MHz	848 kbps	1-100m					
		865 to 868 MHz (EU); 902 to 928 MHz (NA)		1-12m					
		2.45 GHz		1-2m					
		5.8 GHz		up to 200m					
24.125 GHz		up to 200m							