THE RADIO STAR LIVES

MTV hasn't killed it yet…

THE LIVE

MTV hasn't killed it

STAR

Bluetooth edition!

what iz?

Name and logo [edit]

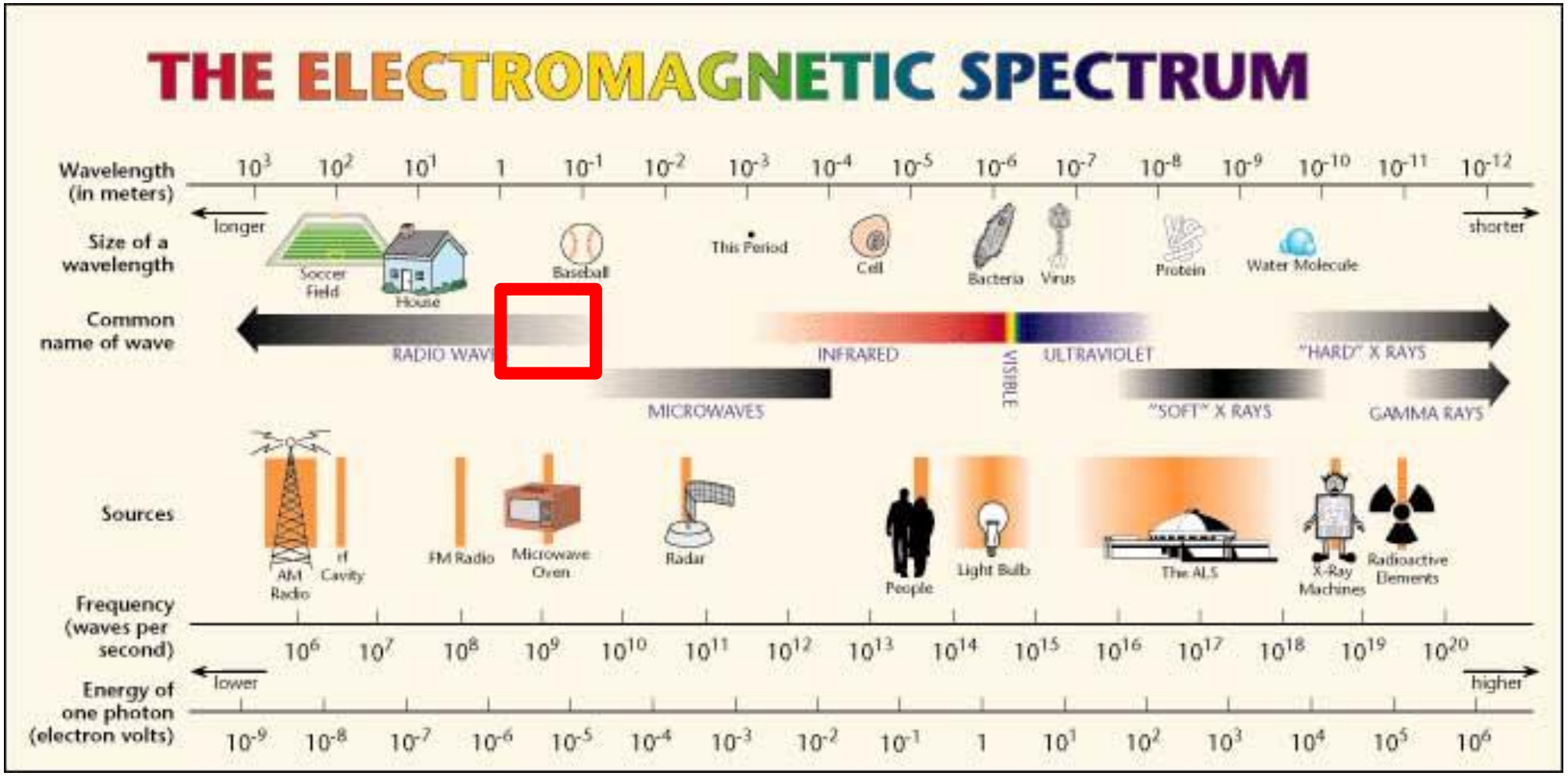
Etymology of the name [edit]

The name "Bluetooth" is an Anglicised version of the Scandinavian *Blåtand*/*Blåtann* (Old Norse *blátǫnn*), the epithet of the tenth-century king Harald Bluetooth who united dissonant Danish tribes into a single kingdom and, according to legend, also introduced Christianity. The idea of this name was proposed in 1997 by Jim Kardach of Intel who developed a system that would allow mobile phones to communicate with computers.[9] At the time of this proposal he was reading Frans G. Bengtsson's historical novel *The Long Ships* about Vikings and King Harald Bluetooth.[10][11] The implication is that Bluetooth does the same with communications protocols, uniting them into one universal standard.[12]

Logo [edit]

The Bluetooth logo is a bind rune merging the Younger Futhark runes ᚼ (Hagall) (ᚼ) and ᛒ (Bjarkan) (ᛒ), Harald's initials.[13][14]

WHERE ARE WE LOOKING?



REMEMBER!

WHAT IS WIRELESS?

- "Radio" (AM, FM)
- TV
- Cell phones - 800MHz &1900MHz
- Wifi - 2.5MHz
- Bluetooth - 2483.5 MHz
- GPS - 1575.42MHz & 1227.60MHz
- Wireless security systems - 2.4MHz (WIFI)
- Any form of Wireless IoT device – 2.4MHz (WIFI)
- SCADA systems / large industrial equipment
- Car Key Fobs -- 315 MHz

ALL USE RADIOWAVES!

Propagation Animation

from Caleb
Madrigal's slides

	Bluetooth Low Energy (LE)	Bluetooth Basic Rate/ Enhanced Data Rate (BR/EDR)
Optimized For...	Short burst data transmission	Continuous data streaming
Frequency Band	2.4 GHz (2.402 GHz to 2.480 GHz)	2.4 GHz (2.402 GHz to 2.480 GHz)
Channels	40 channels with 2 MHz spacing (3 advertising channels/37 data channels)	79 channels with 1 MHz spacing
Channel Usage	Adaptive Frequency Hopping (AFH) 1600 hops/sec	Adaptive Frequency Hopping (AFH) 1600 hops/sec
Modulation	GFSK	GFSK, π/4 DQPSK, 8DPSK
Power Consumption	~0.01x to 0.5x of reference (depending on use case)	1 (reference value)
Data Rate	LE 2M PHY: 2 Mb/s LE 1M PHY: 1 Mb/s LE Coded PHY (S=2): 500 Kb/s LE Coded PHY (S=8): 125 Kb/s	EDR PHY (8DPSK): 3 Mb/s EDR PHY (π/4 DQPSK): 2 Mb/s BR PHY (GFSK): 1 Mb/s
Max Tx Power*	Class 1: 100 mW (+20 dBm) Class 1.5: 10 mW (+10 dbm) Class 2: 2.5 mW (+4 dBm) Class 3: 1 mW (0 dBm)	Class 1: 100 mW (+20 dBm) Class 2: 2.5 mW (+4 dBm) Class 3: 1 mW (0 dBm)
Network Topologies	Point-to-Point (including piconet) Broadcast Mesh	Point-to-Point (including piconet)

Detailz

Cell phones can transmit ~3 watts

Up to 8 devices

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Bluetooth version	Maximum speed[citation needed]	Maximum range[citation needed]
3.0	25 Mbit/s[18]	10 meters (33 ft)
4.0	25 Mbit/s[18]	60 meters (200 ft)[18]
5	50 Mbit/s	240 meters (800 ft)

Data Rate	LE 2M PHY: 2 Mb/s LE 1M PHY: 1 Mb/s LE Coded PHY (S=2): 500 Kb/s LE Coded PHY (S=8): 125 Kb/s	EDR PHY (8DPSK): 3 Mb/s EDR PHY (π/4 DQPSK): 2 Mb/s BR PHY (GFSK): 1 Mb/s
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Detailz

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GATT Overview

The Generic Attributes (GATT) define a hierarchical data structure that is exposed to connected Bluetooth Low Energy (LE) devices.

GATT profiles enable extensive innovation while still maintaining full interoperability with other *Bluetooth®* devices. The profile describes a use case, roles and general behaviors based on the GATT functionality. Services are collections of characteristics and relationships to other services that encapsulate the behavior of part of a device. This also includes hierarchy of services, characteristics and attributes used in the attribute server.

GATT is built on top of the Attribute Protocol (ATT) (see Bluetooth Core System Architecture for block diagram and explanations), which uses GATT data to define the way that two Bluetooth Low Energy devices send and receive standard messages. Note that GATT is not used in Bluetooth BR/EDR implementations, which use only adopted profiles.

Adopted GATT Profile and Service Specifications

Profile Specification		Version	Status	Date Adopted
ANP	Alert Notification Profile	1.0	Active	13 September 2011
ANS	Alert Notification Service	1.0	Active	13 September 2011
AIOP	Automation IO Profile	1.0	Active	14 July 2015
AIOS	Automation IO Service	1.0	Active	14 July 2015
BAS	Battery Service	1.0	Active	27 December 2011
BCS	Body Composition Service	1.0	Active	21 October 2014
BLP	Blood Pressure Profile	1.0	Active	25 October 2011
BLS	Blood Pressure Service	1.0	Active	25 October 2011
BMS	Bond Management Service	1.0	Active	21 October 2014
CGMP	Continuous Glucose Monitoring Profile	1.0.1	Active	15 December 2015
CGMS	Continuous Glucose Monitoring Service	1.0.1	Active	15 December 2015
CPP	Cycling Power Profile	1.1	Active	03 May 2016

Bluetooth® mesh networking

what is mesh?

Bluetooth® mesh networking enables many-to-many (m:m) device communications and is ideally suited for developers and system integrators creating IoT solutions where tens, hundreds, or thousands of devices need to reliably and securely communicate with one another.

It brings the proven, global interoperability and mature, trusted ecosystem associated with Bluetooth technology to the creation of industrial-grade device networks.

where will mesh networking be used?

building automation

From lighting to heating/cooling to security, new control and automation systems can now leverage Bluetooth mesh networking to make homes and offices a lot smarter.

sensor networks

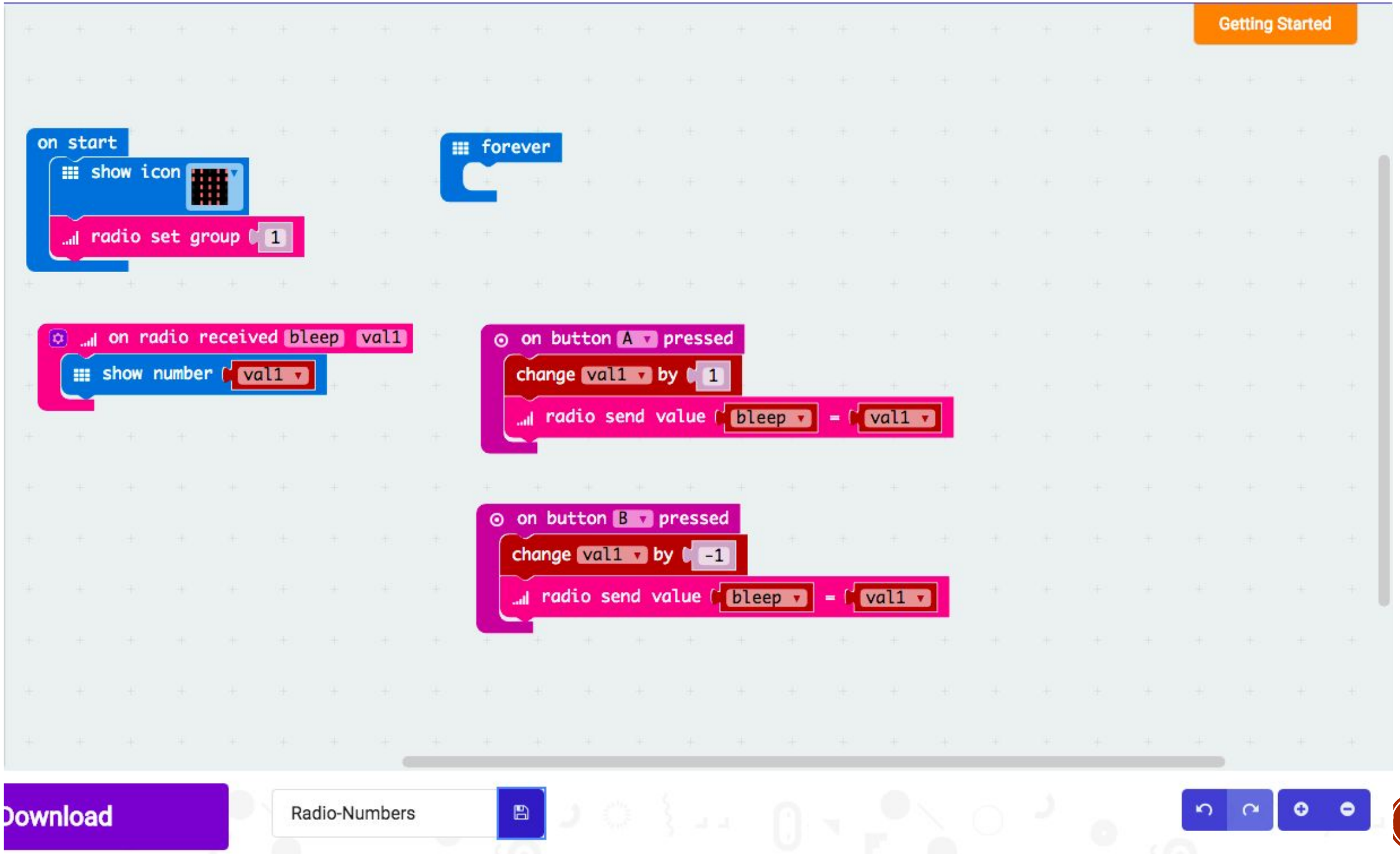
Bluetooth mesh networking now enables industrial operations looking to modernize and expand their sensor networks to increase efficiency and lower costs.

asset tracking

Companies looking to adopt or expand asset tracking capabilities in their facilities can now overcome large or complex environments with Bluetooth mesh networking.


Connector from Kitronik
BBC MicroBit
Red/Green LEDs
Buzzer
Battery pack under here
SELECT
START
4 way buttons
Joy stick

Handz On!


Getting Started
on start
show icon
radio set group 1
forever
on radio received bleep val1
show number val1
on button A pressed
change val1 by 1
radio send value bleep = val1
on button B pressed
change val1 by -1
radio send value bleep = val1
Download
Radio-Numbers

Knowledge Links

h-ttps://www.bluetooth.com
h-ttps://electronics.howstuffworks.com/bluetooth2.htm
h-ttps://en.wikipedia.org/wiki/Bluetooth