A **transmitter** is an electronic device which, usually with the aid of an antenna, propagates an electromagnetic signal such as radio, television, or other telecommunications.

Main stations are defined as those that generate their own modulated output signal from a baseband (unmodulated) input. Usually main stations operate at high power and cover large areas.

Relay stations (translators) take an already modulated input signal, usually by direct reception of a parent station off the air, and simply rebroadcast it on another frequency. Usually relay stations operate at medium or low power, and are used to fill in pockets of poor reception within, or at the fringe of, the service area of a parent main station.

**Wi-Fi transceiver:**


**2.45GHz (UHF-Ultra High Frequency) Gain Adjustable Active RFID Reader** –

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**Overview:**
The 217001 - 2.45GHz Gain Adjustable RFID Reader adopts the advanced 0.18um CMOS IC for ultra-low power consumption. Designed to operate in the unlicensed 2.45GHz band allows the GAO 2.45GHz Gain Adjustable RFID Reader to be deployed in any environment. It’s built in Omni-directional antenna can identify transponder tagged items up to 100 meters in all directions. Users can adjust the identification distance from less than 5 meters to 100 meters according to actual situations in order to make identification more accurate.

**Application Usage:**
Individual Locating, Logistics, and Warehouse Management, Closed loop asset tracking, high value asset tracking

**Specifications:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction</td>
<td>Omni-directional, standard whip antenna</td>
</tr>
<tr>
<td>Range</td>
<td>0 to 100 m adjustable</td>
</tr>
<tr>
<td>Frequency</td>
<td>2.4GHz to 2.5GHz ISM (UHF-Ultra High Frequency)</td>
</tr>
<tr>
<td>RF Output Power</td>
<td>0dBm</td>
</tr>
</tbody>
</table>
Sensitivity | -90dBm
---|---
Power | 50mA, 9V
Modulation | GFSK

<table>
<thead>
<tr>
<th>Mode</th>
<th>Direct Mode and Buffering Mode. In direct mode, readers upload messages to the host system in real time. In buffering mode, readers receive and save messages, which upload only when requested by the host system</th>
</tr>
</thead>
</table>
Dimension | 126 x 104 x 28mm
Buff Capacity | 800 latest messages
Data Rate | 1Mbps
Interface | RS232/485, TCP/IP

Operating Specifications:
- Operating Temperature: -40°C to 80°C
- Operating Humidity: 95% Non-condensing
- Multi-Detection: Yes read
- quantity: 100 tags/sec

Bluetooth Transmitter:

BlueFlyers Base Unit
Temperature Range: 0° to 60° C

TRENDnet Bluetooth Transmitter
- Temperature Range: 0° to 50° C
- Humidity Range: 10 to 90%
- Compliant with Bluetooth v2.0 Specification with EDR (Enhanced Data
• Rate) support
• Backward compatible with Bluetooth v1.1 and v1.2 devices
• Compliant with Class I Bluetooth Operations
• CE, FCC
• 17dBm RF Output Power

AIRcable Bluetooth Transmitter
• Bluetooth Certified (BQB)
• Bluetooth 2.0 compatible with 802.11b tolerance (AFH)
• FCC authorization 15C
• CE certification
• 19.5 dBm RF Output Power
• Temperature Range: -40° to 85° C

Sena UD100
• Bluetooth 2.0+EDR Class 1
• Frequency Range 2.402 ~ 2.480GHz
• Transmit Output Power +19dBm (+6dBm EDR) E.I.R.P
• Regulatory Approvals FCC, CE, TELEC, KCC, Bluetooth SIG
• Temperature Range: -20° to +70° C
• Humidity Range: 90% Non-condensing

FM Transmitter
The FM broadcast can be used to transmit instructions on how to access the BlueFlyers unit, details about a daily special, or music. Multiple MP3 files can be put on the BlueFlyers unit for FM transmission and the unit will rotate through them.

Customers will typically use a cell phone to download the BlueFlyers’ electronic advertisement. The functionality provided by cell phones may be limited by the phones manufacturer or by the cellular service provider. Some Bluetooth enabled phones will only accept virtual business cards or vCards. Other phones will accept audio files also, but not images. Some camera phones do not allow the owner to transfer pictures over Bluetooth to their computer. Capabilities will vary between cell phones.

Wi-Fi Positioning System:
http://www.skyhookwireless.com/howitworks/
Skyhook's Core Engine is a software-only location system that quickly determines device location with 10 to 20 meter accuracy. View a demo of the Core Engine to see it in action now:

To quickly and reliably arrive at accurate location results, the Core Engine collect raw data from Wi-Fi access points, GPS satellites and cell towers with advanced hybrid positioning algorithms. By leveraging the strengths of more than one underlying position technology, Skyhook's Core Engine provides the best possible location available in any environment.

A mobile device with Skyhook's Core Engine collects raw data from each of the location sources. The Skyhook client then sends this data to the Location Server and a single location estimate is returned. The client is optimized so that it communicates with the Location Server only when the location cannot be determined locally. This behavior minimizes the user's data cost while maximizing battery life.

Skyhook's Core Engine leverages:

- A massive reference databases of Wi-Fi access points and cell tower ID's.
- Patented, groundbreaking algorithms.
- Raw position data from each location source available.

Wi-Fi positioning performs best where GPS is weakest, in urban areas and indoors.

GPS provides highly accurate location results in "open sky" environments, like rural areas and on highways. But in urban areas and indoors, tall buildings and ceilings block GPS' view of satellites, resulting in serious performance deficiencies in time to first fix, accuracy and availability. GPS or A-GPS alone cannot provide fast and accurate location results in all environments.

Cell tower triangulation provides generalized location results with only 200 - 1000 meter accuracy. It serves as a coverage fallback when neither GPS nor Wi-Fi is available. Skyhook maintains a worldwide database of cell tower locations, which increases our Core Engine coverage area and helps improve GPS satellite acquisition time.

Wireless System Network (WSN):
http://www.datasheetdir.com/CC2420+ZigBee

Single-Chip 2.4 GHz IEEE 802.15.4 Compliant And ZigBee(TM) Ready RF Transceiver

The CC2420 is a true single-chip 2.4 GHz IEEE 802.15.4 compliant RF transceiver designed for low-power and low-voltage Wireless applications. CC2420 includes a digital direct sequence spread spectrum baseband modem providing a spreading gain of 9 dB and an effective data rate of 250 kbps.
The CC2420 is a low-cost, highly integrated solution for robust Wireless Communication in the 2.4 GHz unlicensed ISM band. It complies with worldwide regulations covered by ETSI EN 300 328 and EN 300 440 class 2 (Europe), FCC CFR47 Part 15 (US) and ARIB STD-T66 (Japan).

The CC2420 provides extensive hardware support for packet handling, data buffering, burst transmissions, data encryption, data authentication, clear channel assessment, link quality indication and packet Timing information. These features reduce the load on the host controller and allow CC2420 to Interface low-cost Microcontrollers. The configuration Interface and transmit/receive FIFOs of CC2420 are accessed via an SPI Interface. In a typical application CC2420 will be used together with a Microcontroller and a few external passive components.

CC2420 is based on Chipcon’s SmartRF-03 technology in 0.18 m CMOS.

CC2420 Application circuits