ADAPTIVATION
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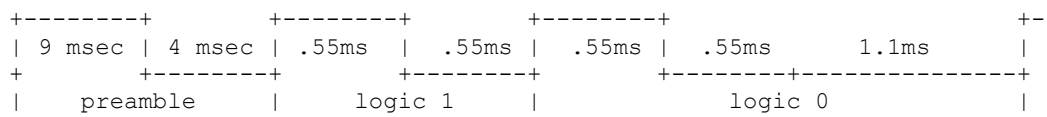
FH-ME Technical Description

The Freehand (FH-ME) is a handheld, battery-powered RF transmitter. Its purpose is to allow users the ability to control AC appliances. The FH-ME transmitted signal is 310-MHz, and is compatible with the prolific X10 protocol. In function, the FH-ME is virtually identical to X10 key chain transmitters available at numerous retail outlets (www.X10.com). The FH-ME is physically much larger, though, to accommodate the needs of persons with disabilities. Typically, the FH-ME is used to turn ON/OFF lamps, radios, stereos, etc. in classrooms and in special education settings.

The dimensions of the ABS plastic enclosure are 3.5” x 3.5” x 2.25”. The FH-ME consists of a PCB, through-hole electronics, and a 1/8-λ wire antenna. Following is a sample diagram showing a portion of the X10 RF protocol. The 310-MHz carrier is modulated by powering the RF oscillator ON/OFF.



Any given command transmitted by the FH-ME sends four logical bytes to the X10 receiver including error detection, resulting in a total transmission length of 65.8 msec.

The on-board microprocessor is held in sleep mode (clock oscillator disabled) until the active switch area is pressed, whereby the microprocessor is activated, and the clock oscillator runs at 4MHz. After the X10 command is transmitted, the microprocessor returns to sleep mode until the switch is pressed again.

The X10 protocol allows up to 256 appliances to be uniquely addressed. The FH-ME has two rotary switches that are used to set this address. The appliance plugged into the X10 receiver module that has the same address as the FH-ME will respond to command signals sent given that the receiver and FH-ME are in range.