

Loop™ 2.0 with Freespace™ In-Air Pointing and Motion Control Technology

The Loop is a remote control developed by Hillcrest Labs for in-air pointing and motion control applications. Hillcrest Labs' Freespace technology enables the Loop to control a wide range of interactive applications through simple hand motions. The Loop's distinctive ergonomic design includes just five buttons and a scroll wheel.

The Loop senses motion in six degrees of freedom and translates the motion into on-screen cursor movements. The Loop also computes linear acceleration and angular velocity in three dimensions to enable gestures, such as tilting, flicking or swinging the device, to control games or other applications.

The Loop together with Freespace demonstrates the efficiency and scalability of pointing as a navigation paradigm. Users can simply point and click at icons on the screen to navigate vast quantities of content.



The Loop works with any consumer electronics device with a USB port that supports Human Interface Device (HID) messages or mouse events. The Loop uses RF to communicate with its USB host (dongle). A reference design for the dongle is available for products designed with an embedded RF receiver. The RF protocol is frequency agile and provides reliable communication between the Loop and host without disturbing or being disturbed by other users within the frequency band.

For companies that want to develop pointer- or motion-enabled software, the Loop can be used as a development tool. Software developers can access the HID messages sent to the host to create Freespace-enabled applications without the need to learn motion-processing algorithms. For a developer the Loop is as easy to interface with as a mouse, keyboard, or game controller.

KEY FEATURES

The core technology for the Loop is called Freespace. Freespace is the world's first orientation free motion control technology. Key features of Freespace are:

High Accuracy

- Unrivaled in-air pointing accuracy allows increased density of on-screen targets, increases target acquisition speed, and produces fewer pointing errors in comparison with mechanical gyroscope and optical devices

Low Latency

- Sophisticated motion algorithms and RF technology ensure minimum latency between user motion and cursor motion, resulting in smooth and accurate pointing and reduced fatigue

Advanced Motion Recognition

- Detects linear acceleration and angular velocity in three dimensions. Applications can recognize gestures, such as tilting, flicking or swinging the device, to control games or other applications

Orientation Compensation

- Hillcrest's patented solution lets users hold the Loop in any orientation and consistently generate intended cursor movement

Standard Interface

- Provides a standards-based interface to all individual motion readings so developers can incorporate precise motion data into any application that can accept HID messages

Tremor Cancellation

- Enables single-pixel precision by removing over 70% of human tremor without increased latency

Power Management

- Manages sensor usage to ensure long battery life and intuitive operation

get the **POINT**

SPECIFICATIONS

Loop™ Specifications	
Dimension (diameter x width)	122 mm x 30.5mm (4.8" x 1.2")
Weight (includes batteries)	141 gm (4.9 oz)
Operating Temperature Range	0°C to 45°C
Storage Temperature Range	-30°C to 70°C
Latency	< 14 ms (typical)
Pointer Sensitivity	35 mickeys / degree
Angular Velocity Resolution	< 0.5 degree / s
Batteries	2 AA

RF Protocol Specifications	
Frequency	2.4 GHz worldwide (2401 MHz to 2482 MHz)
Compliance	FCC part 15
Type	Frequency hopping with adaptive channel selection
Transceiver Transmit Level	+1 dBm with 10 meter range (typical)

HID reports include	
Standard HID Report	Pointer (mickeys), buttons, scroll wheel
Motion Report (body frame)	Linear acceleration (cm / s ²) Angular velocity (rad / s)
Position Report (user frame)	Angular offset (quaternion)

ORDERING INFORMATION

Request part # HL 2003
Email: sales@hillcrestlabs.com
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ABOUT HILLCREST LABS

Hillcrest Laboratories (a.k.a. Hillcrest Labs) sells an application creation platform called HōME™, which enables consumer electronics manufacturers and service providers to create unique interactive digital media products for TV and other digital media devices. Applications made with HōME are controlled by pointing and provide consumers an intuitive way to browse, discover, and interact with large volumes of digital media. Hillcrest Labs' pointing technology, called Freespace™, can be used in a wide range of consumer

devices including remote controls, PC mice, and game controllers. The company's iconic reference device is the Loop™ – a pointer-based TV remote that uses just two buttons and a scroll wheel. HōME and Freespace have received numerous awards including the CES Innovations Award and Popular Mechanics' Editors Choice. Based in Rockville, Maryland, Hillcrest Labs was founded in 2001 by Dan Simpkins. The company is funded by NEA, AllianceBernstein, Columbia Capital and Grotech Capital.

WHAT'S INCLUDED

The Loop and paired dongle, with batteries

- One Loop, one paired USB dongle and two AA batteries.
- Everything developers need to create software applications that take advantage of Freespace.

Evaluation tools

- The Freespace™ Display Panel is a PC application that provides developers with access to the Loop's motion reports in real time via a visual display and reporting tool.
- The Fitts' Law Test Application lets users test the accuracy and performance of Freespace and of the Loop as a pointing device. Reference source code for developing applications using Freespace.

Documentation

- The Quick Start Guide illustrates how to set up and use the Loop.
- The Loop User Guide describes Freespace, the API, and the HID messages and explains how to use the included software.



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