

## ORTHOMOUSE – Technical Description

The electric circuit is built-up on basically three supplemented circuits described below:

The ADNS-2051 is a low cost reliable optical sensor used to implement a non-mechanical tracking engine for computer mice. It is based on optical navigation technology, which measures changes in position by optically acquiring sequential surface images (frames) and mathematically determining the direction and magnitude of movement.

The HT82M98A is a 3D mouse controller designed for USB and PS/2 applications with plug and play functions. It can be described as a 8-bit microcontroller with an on-chip USB interface logic. The USB interface is specified by the Universal Serial Bus Specification V1.0. It supports three buttons (R, M, L) and three axes (X, Y, Z) input and has a 6MHz crystal oscillator for system clock.

PIC12F675 is a 8-Pin FLASH-Based 8-Bit CMOS Microcontroller with High Performance RISC CPU. It operates at 4MHz with internal oscillator and has easy handle interrupt capability. It is programmed in circuit via two I/O pins.

## OPERATION

The Diagram set at the end of this specification shows the data circulation among the main modules of the OrthoMouse.

After the USB cable connection at the microcomputer, the Microcontroller loads the firmware of the Optical Sensor in order to work with a resolution of 800 Dpi and reads its working status to assure that the whole programming was correctly recognized.

The ADNS-2001 is based on Optical Navigation Technology. It contains an Image Acquisition System (IAS) and a Digital Signal Processor (DSP) running at 18MHz. The IAS acquires images of microscopic surface images via the lens and illumination system. These images are further processed by the DSP to determine direction and distance of motion. The DSP generates a stream of delta x and delta y relative displacement values which are then communicated to the output converter. This converter provides two channel quadrature output, for direct interface to the HT82M98A.

The HT82M98A (3D Mouse Controller) works with a 6 MHz clock and its first feature is to detect which type of connection matches with the Microcomputer (PS2 or USB) and in case it's USB, to initiate the protocol of identification (USB type 1). The HT82M98A converts the information of

received position from the optical sensor and go over to the Microcomputer (obeying the protocol established). It also supervises the activation of the right, left and central button of the mouse, showing its activation/deactivation to the Microcomputer.

The scroll buttons are monitored by the Microcontroller (PIC12F675); if the user simply press one of the scroll buttons, the Microcontroller send to the Microcomputer (through the HT82M98A – 3D Mouse Controller) an order to scroll the screen with the configuration of the panel control. If, immediately before pressing the scroll button, the user clicks the same button, before keeping it pressed, the Microcomputer will receive the order to scroll the screen twice faster. And so, successively, until the initial scroll speed is multiplied by five. As soon as the user release the scroll button, the mouse returns to its original situation, waiting some displacement or the activation of any button.

#### Dimensions

Height: 65mm

Width: 82mm

Length with the short extension: 113mm\*

Length with the medium extension: 121mm\*

Length with the long extension: 136mm\*

#### Characteristics (Features)

Supply: +5V (via USB)

Consumption: 1,18W (max)

Plastic Covering: anti-sweat and anti-sliding textured

Sensibility of the optical sensor: 800dpi

Connection USB (adaptor to PS2 included)

## Orthomouse

