

## **C187 RF Optical Mouse & Receiver Specification**

### **1. Preface:**

The functionality and performance requirements related to the mouse and receiver are defined in this specification.

### **2. Version:**

#### **2.1 Radio Frequency**

27MHz, Single Channel with 256 Changeable IDs

27MHz, Dual Channels, 256 Changeable IDs/Per Channel

#### **2.2 Interface**

USB Interface

PS/2 Interface

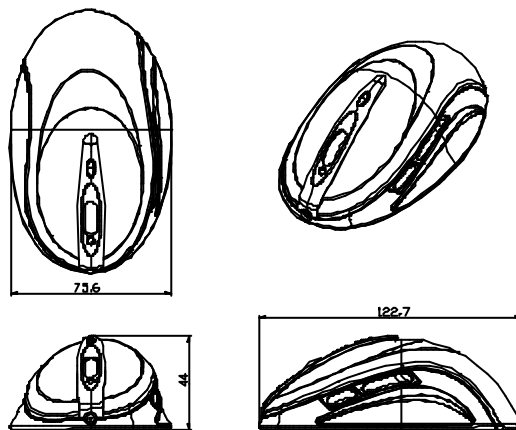
USB to PS/2, Combo

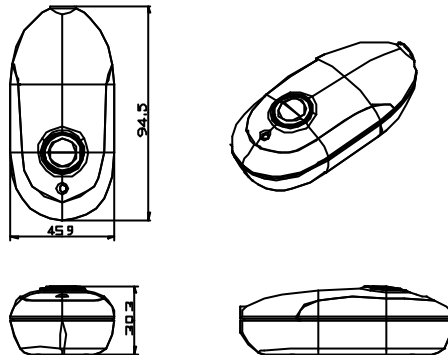
### **3. Physical Characteristics and Configuration:**

#### **3.1 Dimension**

Mouse 122.7mm(L)\*75.6mm(W)\*44mm(H)

Receiver 94.5mm(L)\*45.9mm(W)\*30.3mm(H)





### 3.2 Material

Mouse	Body	ABS
	Wheel	Rubber
Receiver	Body	ABS

### 3.3 Finish

Texture

### 3.4 Color

To be defined by ID

### 3.5 Button

Mouse	3 or 5 buttons with 1 hot key, 1 link switch, 1 channel switch (Option) and 1 DC jack (Option)
Receiver	1 link button

### 3.6 Mechanical Performance

- 3.6.1 Operating force of mouse buttons:  $60 \pm 20\text{gf}$
- 3.6.2 Operating force of side buttons on mouse:  $60 \pm 20\text{gf}$
- 3.6.3 Operating force of browser switch:  $200 \pm 40\text{gf}$
- 3.6.4 Operating torque of wheel scrolling:  $50 \pm 30\text{gf.cm}$
- 3.6.5 Operating force of movable:  $20 \pm 10\text{gf}$
- 3.6.6 Mouse Weight:  $140 \pm 25\text{g}$  (with Batteries)
- 3.6.7 Receiver Weight:  $70 \pm 20\text{g}$  (with Cable)

## 4. Electrical Specification:

### 4.1 Compatibility

The PS/2 mode shall be compatible with IBM PC/XT/AT/386/486/PENTIUM and works with operating system such as DOS, Windows 95/98/2000/ME/XP, and NT as well as the most software applications.

The USB mode is using the low speed interface defined in the USB specification.

It's compliant to the USB specification as well as to the HID class specification REV 1.1.

The USB mode shall be compatible with IBM PC/PENTIUM and works with operating system such as Windows 98/2000/ME/XP as well as the most software applications.

#### 4.2 USB/PS2 Mode Changeable

Combo mode included USB and PS/2 operation modes, using the adapter to change the either one mode on the receiver.

#### 4.3 Technical on Mouse

Optical sensor for X/Y axis, the precise sensor detects motion on hundreds of surfaces, including wood, plastic, and even your pants leg. Scroll wheel uses a mechanical encoder.

#### 4.4 Sensor Report Rate on Mouse

1500 times per second

#### 4.5 Sensor Light on Mouse

Red LED

#### 4.6 Mouse Resolution

The mouse shall have a resolution of  $800 \pm 50$  counts per inch of motion as measured by counting state transitions at the processor-input pins.

#### 4.7 Power Requirement (Receiver)

##### 4.7.1 PS2 Mode

Operating voltage: 5VDC  $\pm 5\%$

Operating current: 30mA (max.)

##### 4.7.2 USB Mode

Voltage range: 4.4V to 5.25VDC

Operating current: 30mA (max.)

Consumption in suspend mode (generic) less than 0.5mA in average value

Data transfer rate: 1.5MHz

Maximal polling rate: every 10ms (limit for low speed device on USB)

#### 4.8 Cable

The length and color of the cable on receiver are defined by ID.

#### 4.9 Operation Angle

The mouse operation angle is 360 degrees.

#### 4.10 Operation Distance

The RF mouse operation distance is more than 1 meter (mouse to receiver set).

#### 4.11 Channel Changeable (for Dual Channels)

The channels are changed by slide switch on mouse.

#### 4.12 ID Changeable

The IDs are changed by link button on mouse and receiver.

#### 4.13 Battery

4.13.1 Battery Type: AAA \* 2

4.13.2 Battery Consumption: Mouse will be on sleep mode, while non-used after 10 minutes.

Mouse works again, need to push any button on it.

Operation mode      100mA (max.)

Stand-by mode      10mA (max.)

Sleep mode      0.20mA (max.)

4.13.3 Battery Low Indicator: when the battery voltage is less than 2.3V, the indicator on the rubber wheel should be light while moving the mouse.

#### 4.14 Tracking Speed

The unit shall be capable of tracking between 50mm/s and 254mm/s of hand movement on the matt white paper without loss of data.

#### 4.15 Charging

Must use 2pcs of the AAA type rechargeable battery in battery compartment. While 1<sup>st</sup> using, should charge 6~8hrs at least. The charge LED on the mouse will be light steadily in charging mode.

4.15.1 Power from Adapter: AC to DC adapter plugs in the mouse.

4.15.1.1 Input: 120V/AC 60Hz

Output: 6V/DC 300mA

4.15.1.2 Input: 230V/AC 50Hz

Output: 6V/DC 300mA

4.15.2 Power from USB Charger: Connect USB port of PC and mouse by USB Charger.

#### 4.16 Data Transmission for Mouse

The indicator for data transmission is green LED on the receiver. While moving the mouse or changing the ID number, the LED will be flash. Otherwise, the indicator lights steadily.

### 5. Software:

Buttons Definition (Default):

Button	Left (1)	Right (2)	Wheel (3)	S-Left (4)	S-Right (5)	Hot Key
Click	Select	Context Menu	Scroll Up/Down	IE Backward	IE Forward	Office Menu
Double Click	Command					
Others			Programmable	Programmable	Programmable	Programmable

### 6. Reliability Testing Specification:

Individual units must pass any and all of the following tests. The order of testing is subject to the tester. Passing the test is defined as functioning properly without significant damage; including but not limited to mechanical failure, electrical failure, chips or cracks in the housing or significant changes in the tactile feel.

#### 6.1 Mean Time Between Failure (MTBF)

The unit shall have an expected MTBF under operating conditions of not less than 150,000 hours (on condition 6 hours per day operation, 250 days per year with 99% confidence level).

#### 6.2 Button Switch Activation

The unit shall survive a minimum of 1,000,000 times (for all of the micro switches on mouse).  
Tested at 1.5 cycles per second.

#### 6.3 Scroll Rotation

The unit shall be rotated a minimum of 100,000 cycles at a speed of 10 cycles per minute at least without electrical load after which measurement shall be made.

#### 6.4 Tracking Life

The unit shall survive a minimum of 100km at a speed of 10cm per second.

#### 6.5 Drop Shock with Bare Unit

Drop the unit from 76cm height onto a concrete floor, on the top, bottom and 3 sides without cable side of the unit (1 time for each side). The unit should be without damage. Damage is defined as failure of the unit to function properly, chips in the housing, or mechanical failure of any of the parts.

#### 6.6 Drop Shock in Gift Box

Drop the unit in box from 91cm onto a concrete floor, on the 4 corners and 6 sides of the box (1 time for each side). Resulting damage should be minimal and shall not allow for contents to escape from packaging.

#### 6.7 Drop Shock in Carton

Unit shall survive a drop test in the weight of product carton on 1 corner, 3 edges and 6 sides from the height onto a concrete floor (1 time for each side).

<= 9.5kg-----91cm

<= 18.6kg-----76.2cm

<= 27.6kg-----61cm

<= 45.3kg-----45.7cm

#### 6.8 High Temperature Test for Operating Pattern

The unit is kept at the temperature of 0 to 40 degrees Celsius and relative humidity of 0% to 95% for 250 hours and then left at ambient room temperature for 1 hour.

#### 6.9 Heat Cycle Test for Shipment Pattern

-40 degrees Celsius to 65 degrees Celsius under 0% to 90% relative humidity with total time of 40 hours, and then left at ambient room temperature for 2 hours.

#### 6.10 Cable Bending Strength

The cable must withstand bending 60 degrees any direction from its centerline; the detail testing conditions as followed:

Load: 100 grams force

Angle: +/-60 degrees around 25.4mm diameter

Speed: 30 cycles/min

Criteria: Min 5,000 cycles, with no visible damage and no breakage in each wire.

#### 6.11 Vibration

Unit shall survive a vibration within a frequency range of oscillation: 5~55Hz with amplitude 0.38mm(p-p) for X, Y and Z axis, each 30min.

### 7. Reliability Performance:

After having been subjected to any and all of the reliability tests outlined in section 6.0, the unit shall meet the following performance specifications:

Button Actuation:

25~55 grams force at outer edge of button (minimum force of actuation)

40~80 grams force in the center of the button.

The buttons must be free from both pre-travel and over-travel.

Pre-travel occurs when the button or the keycap is permitted to move before it contacts the switch.

Over-travel occurs when the button or keycap continues to compress the switch after it is completely depressed.

### 8. Environmental Standards:

#### 8.1 Operating temperature and humidity

Temperature: 0° C ~ 40° C

Humidity: 0% ~ 85% RH

#### 8.2 Storage temperature and humidity

Temperature: -30° C ~ 60° C

Humidity: 0% ~ 90% RH

### 9. Safety and Standards:

The mouse is certified to comply with the limits for class B computing device pursuant, to subpart of part 15 of FCC rules and CE Mark.