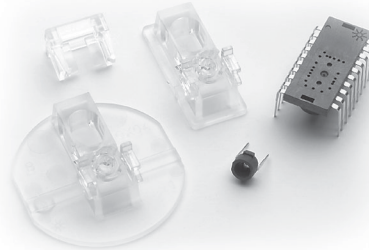


# Agilent ADNB-6011 and ADNB-6012 High Performance Laser Mouse Bundles

## Product Overview



### Description

The Agilent ADNB-6011 and ADNB-6012 laser mouse bundles are the world's first laser-illuminated system enabled for high performance navigation. Driven by Agilent's LaserStream technology, the mouse can operate on many surfaces that prove difficult for traditional LED-based optical navigation. Its high-performance architecture is capable of sensing high-speed mouse motion – with resolution up to 2000 counts per inch, velocities up to 45 inches per second (ips) and

accelerations up to 20G. This sensor is powered for the extremely high sensitive user.

The ADNS-6010 sensor along with the ADNS-6120 or ADNS-6130-001 lens, ADNS-6230-001 clip and ADNV-6330 laser diode form a complete and compact laser mouse tracking system. There are no moving parts, which means high reliability and less maintenance for the end user. In addition, precision optical alignment is not required, facilitating high volume assembly.

### Features

- High speed motion detection – up to 45ips and 20G
- New LaserStream architecture for greatly improved optical navigation technology
- Programmable frame rate over 7080 frames per second
- SmartSpeed self-adjusting frame rate for optimum performance
- Serial port burst mode for fast data transfer
- 400, 800, 1600, and 2000 cpi selectable resolution
- Single 3.3 volt power supply
- Four-wire serial port along with Power Down, and Reset pins
- Laser fault detect circuitry on-chip for Eye Safety Compliance

### Applications

- Mice for game consoles and computer games
- Mice for desktop PC's, Workstations, and portable PC's
- Trackballs
- Integrated input devices

### ADNB-6011 and ADNB-6012 High Performance Laser Mouse Bundles include:

Bundle Part Number	Part Number	Description
ADNB-6011	ADNS-6010	High Performance Laser Mouse Sensor
	ADNV-6330	Single-Mode Vertical-Cavity Surface Emitting Laser (VCSEL)
	ADNS-6120	Laser Mouse Round Lens
	ADNS-6230-001	Laser Mouse VCSEL Assembly Clip

Bundle Part Number	Part Number	Description
ADNB-6012	ADNS-6010	High Performance Laser Mouse Sensor
	ADNV-6330	Single-Mode Vertical-Cavity Surface Emitting Laser (VCSEL)
	ADNS-6130-001	Laser Mouse Trim Lens
	ADNS-6230-001	Laser Mouse VCSEL Assembly Clip



### Navigation by Two Images Comparison

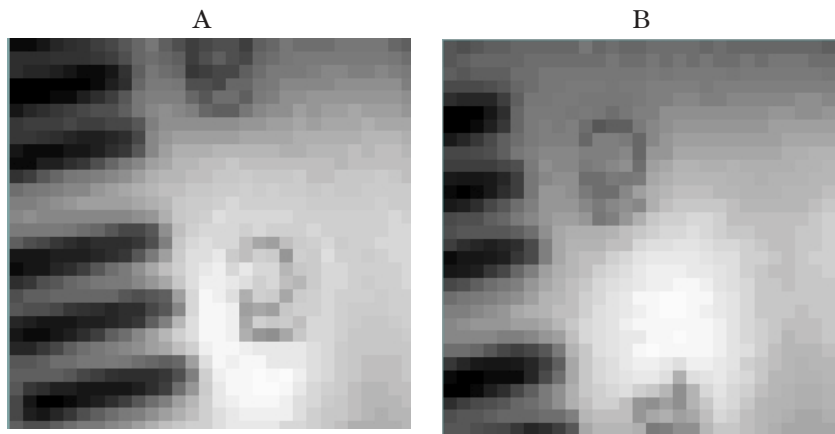


Figure 1. The Navigation Engine identifies common features in sequential images to determine the direction and amount of mouse movement. Image B was taken while the mouse was moving in the southeast direction, a short time after image A.

### Theory of Operation

The ADNS-6010 is based on LaserStream Technology, which measures changes in position by optically acquiring sequential images (frames) and mathematically determining the direction and magnitude of movement.

ADNS-6010 contains an Image Acquisition System (IAS), a Digital Signal Processor (DSP), and a four wire serial port. The IAS acquires microscopic surface images via the lens and illumination system. These images are processed by the DSP to determine the direction and distance of motion. The DSP calculates the  $\Delta x$  and  $\Delta y$  relative displacement values. An external microcontroller reads the  $\Delta x$  and  $\Delta y$  information from the sensor serial port. The microcontroller then translates the data into PS/2 or USB signals before sending them to the host PC or game console.

### 2D Assembly Drawing of ADNB-6011, PCBs and Base Plate

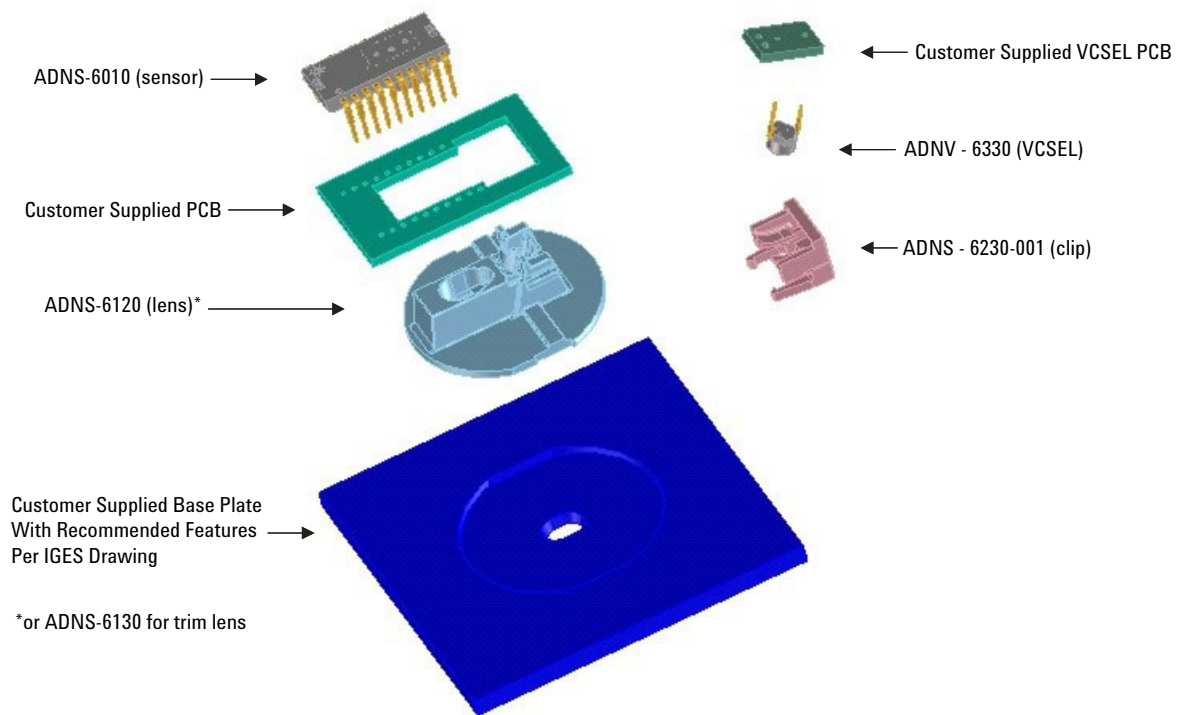


Figure 2. Exploded View Drawing of Laser Mouse Components

### Recommended Typical Application Block Diagram

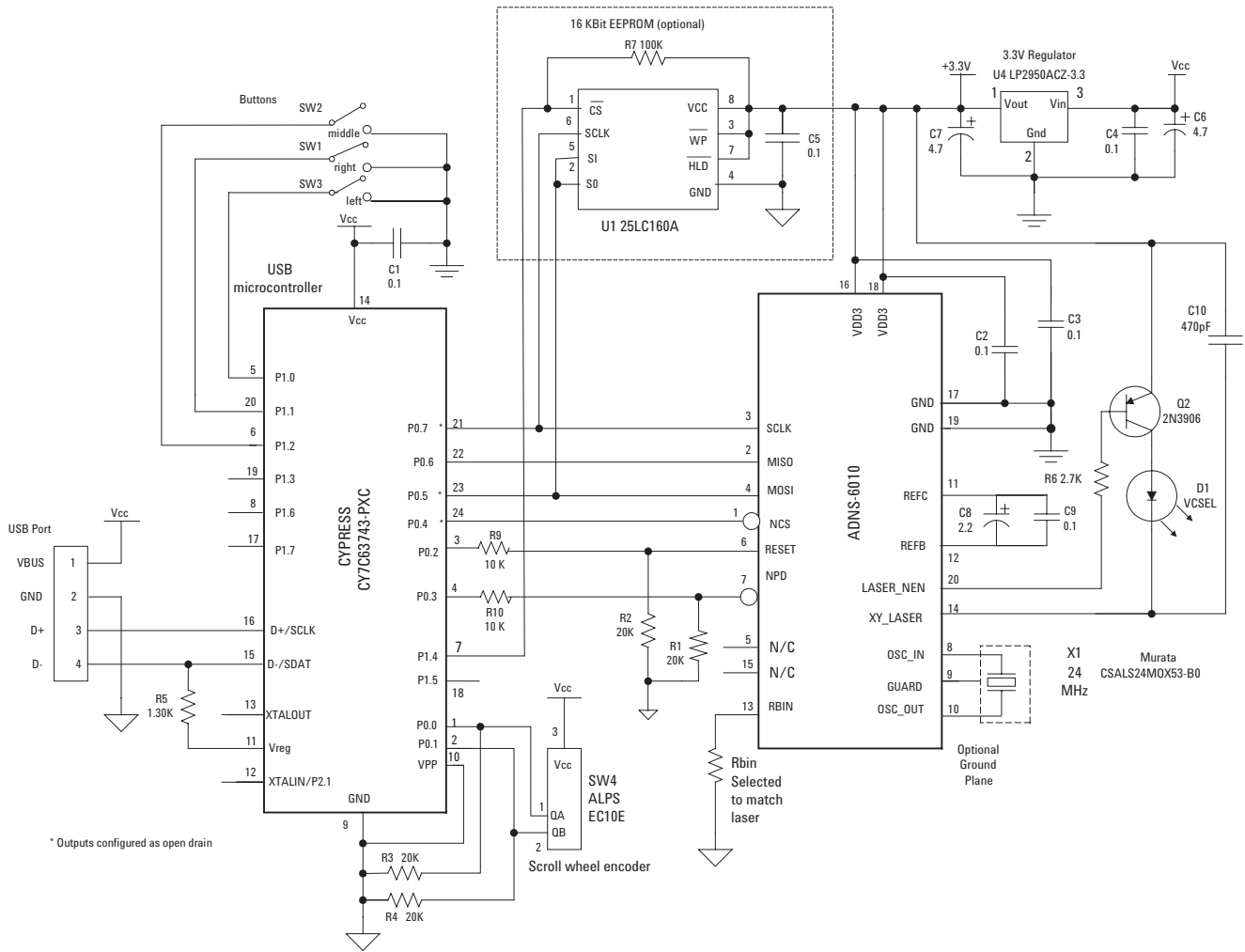


Figure 3. Schematic Diagram for 3-Button Scroll Wheel USB PS/2 Mouse

### Laser Bin Table

Bin Number	Rbin Resistor Value (kohm)	Match_Bit (Reg 0x2C, Bit7)
2A	18.7	0
3A	12.7	0

## ADNS-6010 Key Specifications

Parameter	Symbol	Min	Typical	Max	Units	Notes
Operating Temperature	$T_A$	0		40	°C	
Power supply voltage	$V_{DD3B}$	3.10	3.30	3.60	Volts	Regulator Bypass
DC Supply Current	$I_{DD\_AVG}$			53	mA	DC average at 7080 fps. No DC load on XY_LASER, MISO.
Power Down Supply Current	$I_{DDPD}$		5	90	$\mu$ A	NPD=GND SCLK, MOSI, NCS=GND or $V_{DD3}$ RESET= $V_{DD3}$
Oscillator Frequency	$f_{CLK}$	23	24	25	MHz	Set by ceramic resonator
Distance from lens reference plane to surface	Z	2.18	2.40	2.62	mm	Results in +/- 0.2mm minimum DOF
Speed	S			45	in/sec	
Acceleration	A			20	G	
Frame Rate	FR	2000		7080	Frames/s	

## Laser Mouse Design References

Datasheet Agilent ADNB-6011 and ADNB-6012 High Performance Laser Mouse Bundles

Application Note 5088, Agilent ADNB-6001, ADNB-6002, ADNB-6011 and ADNB-6012 Laser Mouse Sensor Eye Safety Calculations

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