



HeadMouse[®]
for Portables

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Introduction

The *HeadMouse for Portables manual* is a guide to the use and operation of the HeadMouse for Portables head controlled pointing device. Before using the system please read this manual and give special attention to the hardware description and installation chapters.

Please note that there may be additional documentation shipped with your HeadMouse for Portables, in the form of hard copy or machine-readable addenda.

User Registration

Please complete and return the enclosed user registration form. This will ensure that you receive any updates following your purchase. In addition you will be on the list to receive follow-on product information and new product announcements. This registration is especially important if your organization's ship to address is different than your first class mail address.

Warranty Terms

Origin Instruments warrants to the Customer that the products it manufactures will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period Origin Instruments, at its option, will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under the foregoing warranties, the Customer must notify Origin Instruments of the defect before the expiration of the warranty period. In addition, the customer must obtain a Return Material Authorization (RMA) number and include this number in all correspondence regarding the warranty claim. The RMA number (#) shall appear on the address label as indicated below. The Customer shall be responsible for packaging and shipping the defective product, with shipping prepaid, to:

Attn: Customer Service, RMA # _____
Origin Instruments Corporation
854 Greenview Drive
Grand Prairie, TX 75050-2438
USA

Telephone: 972-606-8740 FAX: 972-606-8741
email: support@orin.com

Origin Instruments will pay for the return of the product to the Customer if the shipment is to a location within the United States. The Customer will be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to other locations.

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Chapter 1, Hardware Description

The HeadMouse for Portables is a self-contained optical head-tracking sensor optimized for mobile applications. The Portable HeadMouse tracks side-to-side and up-and-down head movements and uses this information to directly control the position of the on-screen mouse pointer. The integrated power adapter can operate from a twelve or twenty-four volt battery as well as from a standard wall transformer or power supply. This integrated power adapter also provides a conditioned twelve volts for use with automotive style power supplies sold by most laptop computer manufacturers.

The HeadMouse for Portables consists of two components. These are the Sensor and the Interface Unit. The Sensor contains the optical transceiver while the Interface Unit contains the computer interface electronics, input and output connections, and the intelligent power adapter. The Sensor is attached to the Interface Unit with a single cable. Separation of the Sensor from the power and computer interface subsystems greatly facilitates system integration of the HeadMouse in mobile applications.

Adaptive switches are connected directly to the Interface Unit and are used to emulate mouse button “clicks”.

The HeadMouse is connected to the host computer using either a standard nine pin serial cable or an Origin Instruments’ Smart Cable. The Smart Cables are for conversion of the EIA-232 serial port of the HeadMouse to other mouse communication protocols such as the Apple Desktop Bus and IBM PS/2.

This chapter will describe the HeadMouse for Portables, the Smart Cables and the integrated power adapter.

HeadMouse for Portables Sensor

Please refer to Figure 1 for the following description. The Sensor can be thought of as a wide field-of-view camera with an infrared illuminator. The lens and illuminator of this so-called camera are located behind the special dark window that is transparent to infrared light. For best results and long term Sensor operation do not touch the window and do not clean it unless absolutely required. It should *not* be cleaned as part of a regular maintenance program. If cleaning does become necessary, refer to the maintenance instructions in Chapter 5.

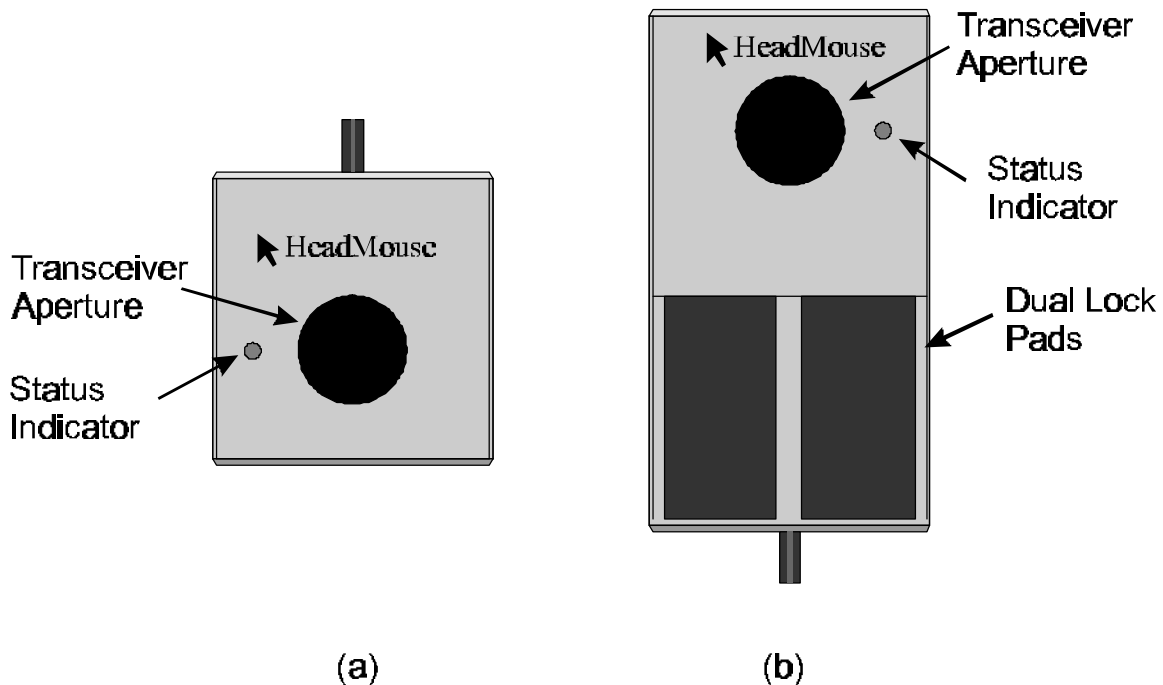


Figure 1. Front view of the two styles of the HeadMouse for Portables Sensor. (a) Designed for attachment to devices such as augmentative communication devices. (b) Standard Sensor is designed for attachment to the rear of a laptop display. Both Sensors are mounted using Dual Lock type fasteners.

In addition to the optical components, there is a HeadMouse system status indicator on the Sensor as well. It is used to indicate the state of the integrated power adapter and the present state of the HeadMouse tracking system. The power adapter's status is indicated by a series of flash codes that are listed in Table 3 and further described in the Integrated Power Adapter section of this chapter. For indicating HeadMouse tracking status, the indicator is illuminated in one of three colors, as indicated in Table 1.

When a target is not in the Sensor's field-of-view or is beyond its maximum tracking range, the HeadMouse will be "Searching" for a valid target. Once a valid target is found the HeadMouse transitions into "Track" mode and begins sending mouse position commands to the computer. If the target exceeds the maximum track range or leaves the field-of-view then the HeadMouse transitions back into "Searching" for a valid target. If a valid target is in track and the target is moved to the maximum range or just at the edge of the field-of-view then the HeadMouse will enter a marginal tracking state. The HeadMouse is still tracking the target but the tracking performance will degrade.

Table 1. Tracking status as indicated by the status indicator .The Integrated Power Adapter also uses this indicator to signal power loss events, see Table 3.

Color	HeadMouse Status
Green	Tracking
Yellow	Tracking but conditions are marginal
Red	Searching

Interface Unit

The Interface Unit contains the computer interface electronics, the intelligent power adapter, the input/output connectors and. the main power switch. An illustration of the Interface Unit's rear panel is shown in Figure 2.

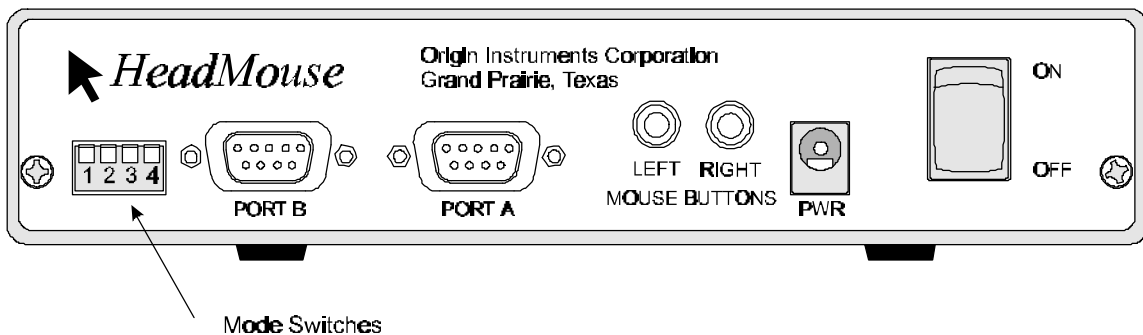


Figure 2. Rear view of the HeadMouse Sensor. PORT A and PORT B are industry standard DB-9 connectors. The MOUSE BUTTON connectors are industry standard 1/8 inch (3.5 mm) microphone jacks. Apple Macintosh mouse button "clicks" are input through the "LEFT" jack.

The four mode switches, described in Table 2, control the optical Sensor's orientation and the integrated power adapter's functionality. Switches one and two are used to set the Sensor's orientation in the 12-, 3-, 6-, or 9-o'clock position. Mode switches three and four are used to enable the accessory socket and designate that the Interface Unit is connected to a battery. Once enabled, the integrated power adapter will automatically determine the input battery voltage (12- or 24-volt) and remove all loads once the battery is fully discharged. The factory defaults for the mode switches are switches 1, 3 and 4 down with switch 2 positioned appropriate for the specific HeadMouse Sensor, see Figure 1.

Table 2. HeadMouse for Portables mode switch settings. The orientation description is in reference to a front view of the Sensor. Please refer to Figure 1 for front views of the miniature and standard Sensors. (X-not applicable, D-Down, U-Up)

1	2	3	4	HeadMouse Sensor Orientation
D	D	X	X	Sensor cord extends from the bottom
U	D	X	X	Sensor cord extends from the right side
D	U	X	X	Sensor cord extends from the top
U	U	X	X	Sensor cord extends from the left side
1	2	3	4	HeadMouse Power Adapter Mode
X	X	D	D	Standard Mode* (AC adapter use, accessory socket disabled.)
X	X	U	D	Factory Special
X	X	D	U	Factory Special
X	X	U	U	Automatic Mode** (Battery use, accessory socket enabled.)

* 8- to 24-volt DC Input.

**12- or 24-volt DC input. The low current AC wall transformer shipped with the HeadMouse for Portables should not be used to power devices from the accessory socket.

There are two serial ports (EIA-232C) that use DB-9 connectors and two switch inputs that use 1/8-inch (3.5mm) microphone jacks. Serial port A is used to communicate with the host computer and serial port B is used to communicate with accessory devices such as a desktop mouse. The microphone jacks are used to input the “LEFT” and “RIGHT” mouse button “clicks” to the HeadMouse. Apple Macintosh mouse button “clicks” are input through the “LEFT” jack. The connectors are wired so that the “LEFT” and “RIGHT” normally open switch contacts are on the “TIP” and switch common is on the “SLEEVE”. Figure 3 illustrates how the mating 1/8-inch (3.5mm) microphone plug should be wired.

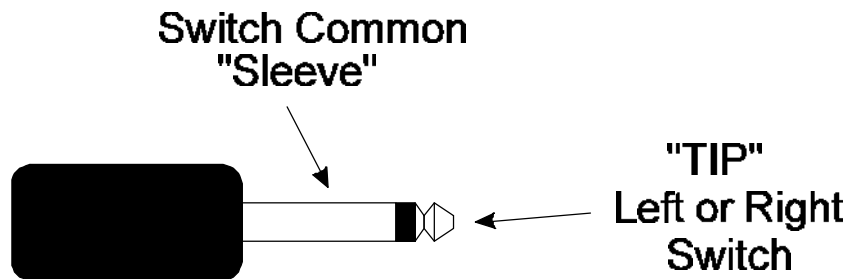


Figure 3. Adaptive switches are input using 1/8-inch (3.5mm) microphone connectors.

Integrated Power Adapter

The power adapter integrated into the HeadMouse for Portables is designed to provide power to the HeadMouse system as well as to any 12-volt DC device connected to the accessory socket. Even though the accessory socket can be used to power any 12-volt device, it was specifically designed to power a laptop computer using an automotive (cigarette lighter style) power supply. This intelligent power adapter eliminates the requirement for additional equipment in order to operate from a 12- or 24-volt lead-acid battery. The input power connection to the HeadMouse for Portables is specifically designed for direct connection to a 12-volt scooter battery, a 12-volt battery pack, or a 24-volt wheelchair battery.

The input is fully protected from voltage transients and inadvertent connections to reverse polarity voltage. The HeadMouse can be powered by any 12- or 24-volt DC source of sufficient current capacity. Figure 4, illustrates the proper polarity and size of the mating power plug. The HeadMouse for Portables is shipped with an AC wall transformer for use with 110-volts at 60-cycles. This wall transformer has been sized to power the HeadMouse. When external devices are powered from the accessory socket and current is supplied from the AC mains, an Origin Instruments high current power supply will be necessary. This Origin Instruments high current supply can also be used to power the HeadMouse in countries where the AC mains voltage is 220-volts at 50-cycles.

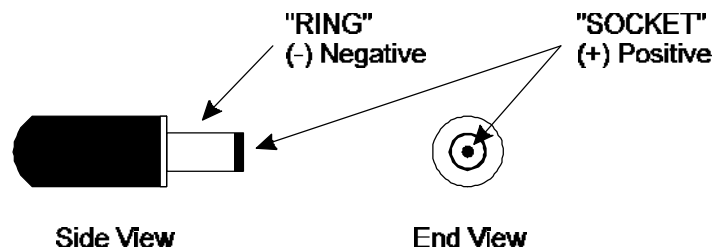


Figure 4. Mating power connector for the Interface Unit. Center conductor is 0.1 inch (2.5mm) in diameter and the outside ring diameter is 0.21 inch (5.5mm).

The integrated power adapter must be in the automatic mode when powering devices from the accessory socket. In this mode, the power adapter automatically determines whether the Interface Unit is connected to a 12- or 24-volt battery, supplies 12-volts to the accessory socket and monitors the battery in order to prevent its deep discharge. When connected to a 12-volt battery the input voltage is directly switched to the accessory socket. When connected to a 24-volt battery an internal voltage converter is enabled which provides 12-volts to the accessory socket.

NOTE

Battery capacity management associated with operation of a power wheelchair is the responsibility of the chair's user. If allowed, the integrated power adapter in the HeadMouse will consume the total capacity of the wheelchair battery. Therefore, the user must be aware of remaining battery capacity and retain a sufficient amount for transport to a charging station.

The intelligent power adapter also measures the terminal voltage of the attached lead-acid battery to determine its state-of-charge. When the power adapter determines that the battery is almost discharged, it will reduce load on the battery as described below. First, the status indicator is used to indicate imminent loss of voltage on the accessory socket, as described in Table 3 and then voltage will be removed from the accessory socket. This should substantially reduce current demand on the battery and allow the HeadMouse to continue operating. The assumption is that if the accessory device is a laptop computer, it can continue operating on its internal batteries. Once the remaining battery capacity has been consumed, the power adapter will indicate the imminent loss of power using the status indicator and shut down the HeadMouse. This intelligent power management will provide maximum utilization of the battery's capacity while eliminating the possibility of damage to the battery by its deep discharge.

Table 3. Status indicator flash codes for power loss events.

Power Loss Event	Status Indicator Flash Code
Power will be removed from the accessory socket in approximately three minutes.	Five-second burst of a flashing green status indicator repeated every fifteen-seconds until the accessory socket is disabled.
HeadMouse loss of power in approximately four minutes.	Five-second burst of a flashing red status indicator repeated every fifteen-seconds until HeadMouse shutdown.

The accessory socket and connector for the Sensor are on the front panel of the Interface Unit. In addition to the connectors, there is a heat sink for the integrated power adapter. It is important that the heat sink be exposed to free air circulation when external devices are powered from the accessory socket.

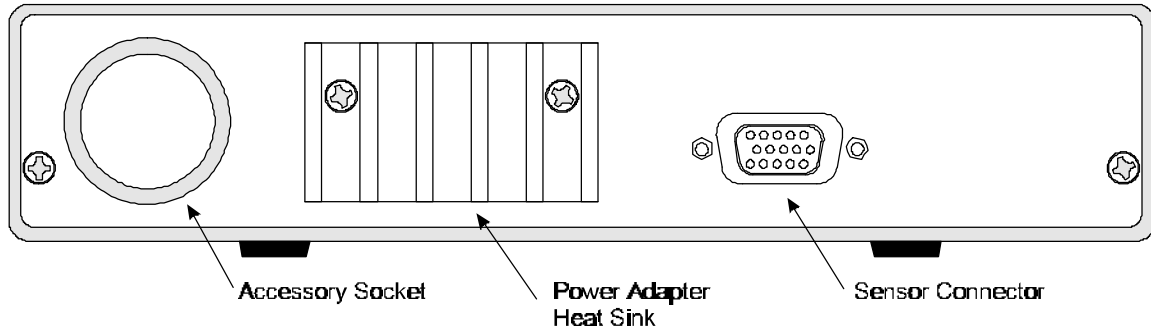


Figure 5. View of the Interface Unit front panel.

The accessory socket is an automotive-style power port and can accept 12-volt devices designed for use in automobiles. This port is rated for 12-volts at 2.5-amps and is protected with a special current limiting device. This special device is a thermal switch that opens whenever the flow of current to the accessory socket is excessive. To reset the thermal switch, the Interface Unit's main power is turned off and the thermal switch is allowed to cool. Depending on ambient temperature and the severity of the overload, the time required for reset could be several minutes. In addition to over current protection, the accessory socket is also protected from voltage transients generated by externally connected devices.

The Sensor is connected to the DB-15F-HD connector. This connection should be made before main power is applied to the Interface Unit. Once connected, the thumbscrews on the cable should be secured.

Smart Computer Interface Cables

To convert the standard serial (EIA-232C) port format of the HeadMouse to a communication format used by other computers, Origin Instruments has developed a series of Smart Cables. Presently, cables are available for Apple Macintosh computers and for computers that use the IBM PS/2 mouse format. These Smart Cables convert the HeadMouse, mouse format to the appropriate format. The cables are interchangeable so that one HeadMouse system can be used with different computers. All that is required is a simple change of the host interface cable. These cables are completely transparent to the HeadMouse, the host computer, and the application software.

If the host computer uses a standard serial port (EIA-232C) for a desktop mouse then only a standard DB9M to DB9F cable is required.

Mounting Provisions

The HeadMouse for Portables is designed for ease of integration in applications involving Augmentative and Alternative Communication (AAC) devices and laptop computers. Even though the HeadMouse for Portables has been designed for operation in a portable environment, it is not designed to withstand immersion or drenching with liquids. In

addition, it is not designed to withstand high physical stress. Therefore, location of the constituent components and the mounting technique are important for long-term system reliability.

The miniature optical Sensor is attached with Dual Lock to typical AAC devices or laptop computers. The Interface Unit can be attached with generic wheelchair mounting adapters or stored in a satchel. Provisions for attaching the Interface Unit to a mounting adapter are provided by four 8/32-inch nuts pressed into the bottom of the enclosure, as shown in Figure 6. The Sensor and Interface Unit may be mounted in any orientation. However, Sensor orientation must match the orientation mode switch setting on the Interface Unit.

NOTE

Screws attached to the Interface Unit must extend at least 0.075 inches (2 millimeters) and NOT more than 0.1 inches (2.5 millimeters) into the inserted nuts. Screws that extend further than 0.1 inches into the nuts may damage the Interface Unit.

When using a mounting adapter, tighten the associated bracket against the rubber feet on the base of the Interface Unit. The 0.1 inch (2.5 millimeter) tall rubber feet will help shock isolate the Interface Unit from the bracket. The maximum tightening torque for these fasteners is 4 inch-pounds (0.5 Newton • meters). Higher torque may twist the nuts out of the enclosure.

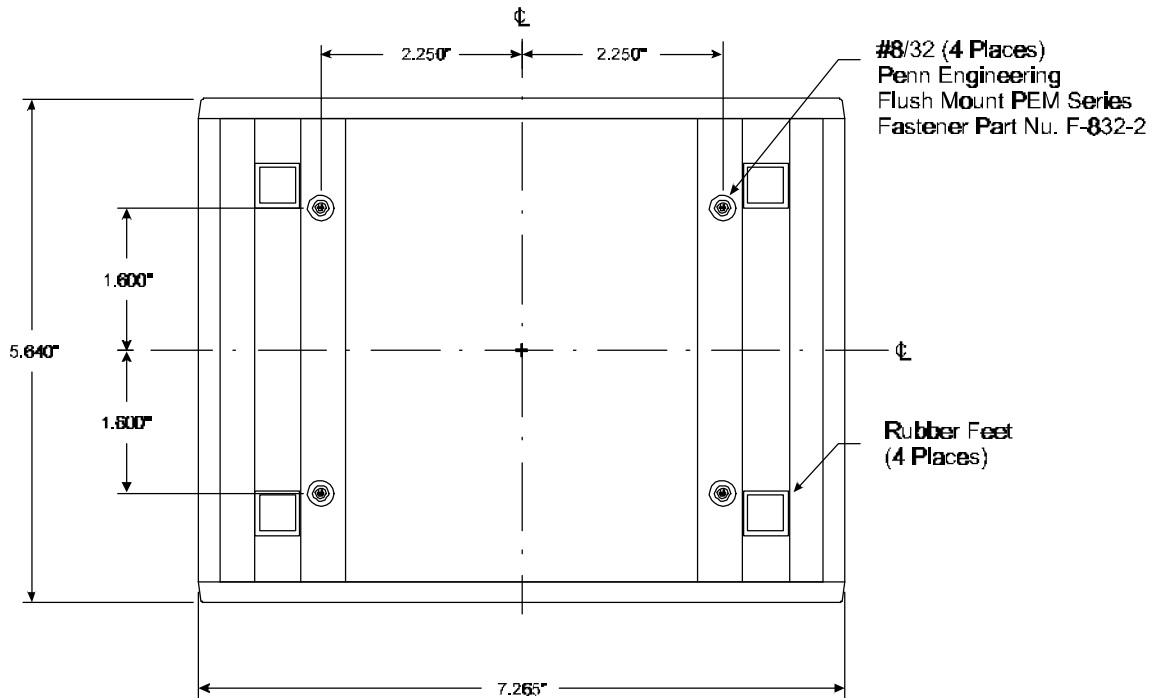


Figure 6. Position of 8/32" fasteners in the bottom of the Interface Unit. Mating screws shall not extend into the enclosure more than 0.1 inch (2.5 millimeters). The dimensions above are nominal and are relative to the centerline of the aluminum extrusion.

Chapter 2, Installation

EMI Considerations

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

If the HeadMouse for Portables is suspected of causing interference to a radio or television receiver, cycle it's power on and off to determine whether it is the cause of the disturbance. If a problem exists, it may be corrected by one of the following measures:

1. Reorient the antenna of the affected receiver.
2. Relocate the equipment with respect to the receiver.
3. Move the equipment away from the receiver.
4. Plug the equipment into a different AC outlet so that the equipment and receiver are on different branch circuits.
5. Ensure that the equipment data cables and cover are properly installed and tight.
6. Reorient the equipment cables.
7. Consult Origin Instruments for additional suggestions.

Origin Instruments is not responsible for any problems caused by unauthorized modification of this equipment.

Set-up

This section of the document will describe how the HeadMouse is attached and connected to your computer or Augmentative and Alternative Communication (AAC) device, and will provide options for attaching the target dot.

The HeadMouse for Portables is an optical tracking system and it must be installed so that the HeadMouse Sensor can see the target dot. This means that the Sensor should be positioned on the computer display so that it has an unobstructed view of the target dot attached to the user's head. Generally, the optimum placement and orientation will have the Sensor and user looking directly at each other at a distance in the range of two to three feet — eyeball-to-“eyeball”. However, as shown in Figure 7, the Sensor does have a large 50° field-of-view and can easily track the target to four feet. You can tell whether the Sensor can see the target dot by the color of the “Status” light. When this light is green, the Sensor can see the target and is tracking. When it's red, the target is obscured or out of the Sensor's field-of-view. If the status light is yellow, the target is either at the edge of

the Sensor's field-of-view or operating range. Feel free to experiment with the environment to determine the optimum placement and orientation of the Sensor.

It is important to remember the HeadMouse simply replaces an existing desktop mouse. The HeadMouse like any desktop mouse requires a mouse driver. Standard mouse drivers are included with both the Macintosh operating system and all versions of Microsoft Windows. In the case of Microsoft Windows, the mouse driver will be installed if a Microsoft compatible mouse (standard desktop mouse or HeadMouse) is connected to the computer during Windows installation. The Macintosh mouse will be installed whenever the operating system determines that an Apple Desktop Bus (ADB) mouse is connected. If the HeadMouse will be used with MS-DOS, and a mouse driver hasn't previously been installed for DOS please refer to your Windows ReadMe files under "Using Specific Mice with Windows Version 3.1". Windows 95 installs a mouse driver that can be used in an MS-DOS session.

For AAC devices, please refer to the device manual for instructions on interfacing to a mouse.

HeadMouse for Portables Installation

1. Remove the Sensor and Interface Unit from the box, taking care not to touch the dark optical window on the Sensor's front panel. Using the included Dual Lock pads or double stick tape, attach the Sensor to the computer display or AAC device as shown in Figure 8. Depending on what was ordered you will have received a standard or miniature Sensor. The standard Sensor is typically used with laptop computers while the miniature Sensor is often used with dedicated AAC devices.

When mounting to a laptop computer display, position the standard HeadMouse Sensor so that the optical window is approximately one inch above the top edge of the computer display. It is important that the top edge of the display not be in the Sensor's field-of-view. If it is, you may see erratic mouse behavior. Also, you should generally position and orient yourself and the Sensor so that you are looking directly at the Sensor — eyeball to "eyeball". Mode switches one and two should be set as indicated in Table 4 for "cord extends from the bottom" Sensor orientation (Switch 1 and Switch 2 down).

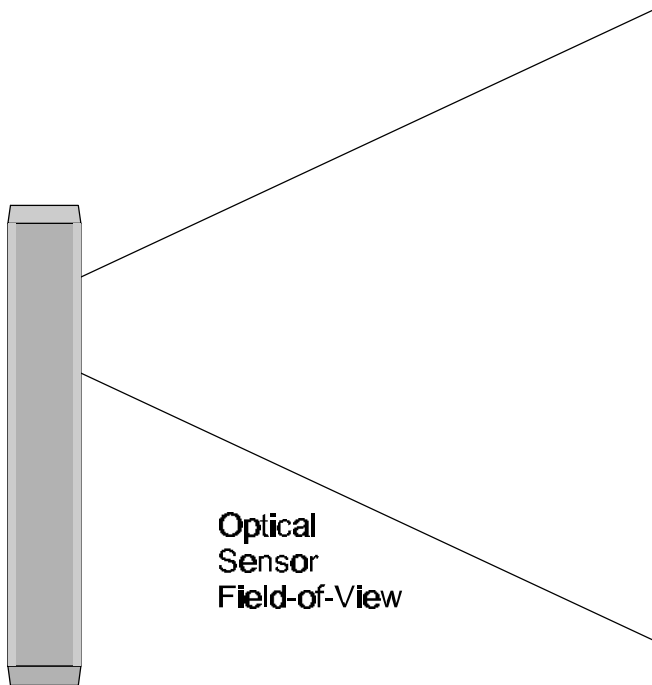


Figure 7. Side view of the Optical Sensor and its 50° field-of-view. Objects closer than approximately 12 inches (30 cm) should not be within the Sensor's field-of-view.

When mounting the miniature Sensor, set orientation mode switches one and two as indicated in Table 4 for “cord extends from the top” (Switch 1 down and Switch 2 up).



Figure 8. HeadMouse for Portables attached (a) to a laptop computer using the standard Sensor and (b) to an AAC device using the miniature Sensor. In both cases, the Sensor is attached using Dual-Lock or double stick tape.

2. **Using the HeadMouse for Portables with an AC power adapter:** (Skip to step three for use with a battery.) Plug the AC adapter into the appropriate AC mains wall socket. Then insert the adapter output cord into the “PWR” connector on the Interface Unit. See wiring diagram in Figure 9. A high current AC power supply is optionally available for powering a laptop computer from the Interface Unit accessory socket. (Skip step three and continue with step four.)

Table 4. HeadMouse for Portables operating mode switch description. Mode switches are accessed through the panel opening next to "PORT B" on the Interface Unit. (X-not applicable, D-Down, U-Up)

1	2	3	4	HeadMouse Sensor Orientation
D	D	X	X	Sensor cord extends from the bottom
U	D	X	X	Sensor cord extends from the right side
D	U	X	X	Sensor cord extends from the top
U	U	X	X	Sensor cord extends from the left side
1	2	3	4	HeadMouse Power Adapter Mode
X	X	D	D	Standard Mode* (AC adapter use, accessory socket disabled.)
X	X	U	D	Factory Special
X	X	D	U	Factory Special
X	X	U	U	Automatic Mode** (Battery use, accessory socket enabled.)

* 8- to 24-volt DC input.

**12-or 24-volt DC input. The low current AC wall transformer shipped with the HeadMouse for Portables should not be used to power devices from the accessory socket.

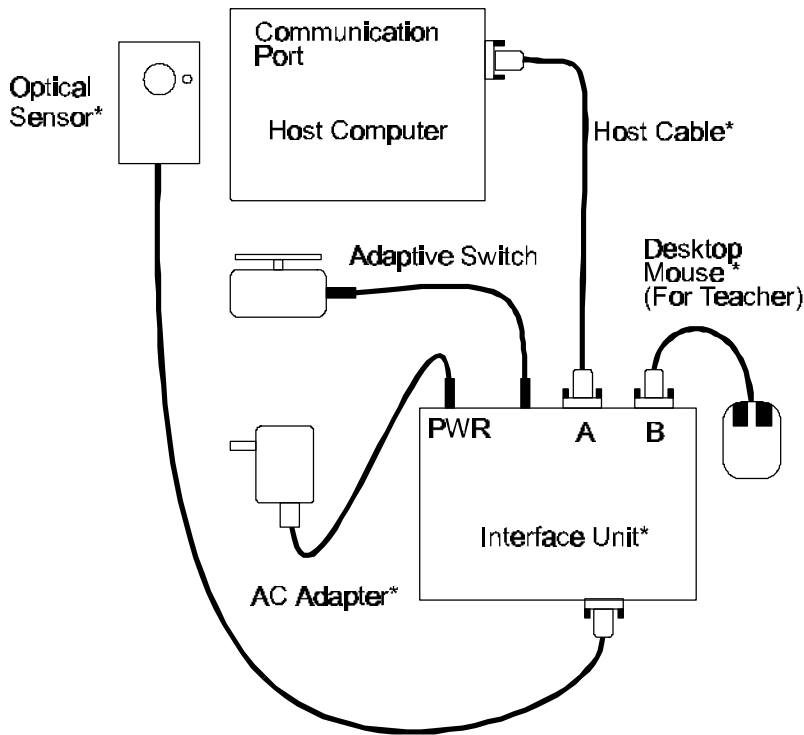


Figure 9. Wiring diagram for using the HeadMouse for Portables with an AC adapter and the Teach mode mouse. A high current AC power supply is available for powering the laptop computer through the HeadMouse Interface Unit. (* - These items are supplied by or are available from Origin Instruments.)

3. **Using the HeadMouse for Portables with a 12- or 24-volt battery:** Connect the HeadMouse for Portables as shown in Figure 11. Please note an automotive power adapter, specific to the laptop computer, or AAC device, connects to the accessory socket on the Interface Unit front panel. To obtain the appropriate cable, contact the

manufacturer of the computer or AAC device. This accessory socket provides a nominal 12-volts at 2.5 amps to the adapter from the 12- or 24-volt battery. **Note, the HeadMouse for Portables is shipped from the factory set to Standard Mode (AC adapter use).** Refer to Table 4 for a description of the mode switch settings. Run time for the HeadMouse and connected laptop computer is dependent on battery capacity, and the HeadMouse and laptop computer power demand.

Set the mode switches to Automatic Mode (Battery use.) The Interface Unit will automatically determine the input battery voltage, provide 12-volts to the accessory socket, and remove load before the battery is deep discharged. Prior to load removal, a series of "Status" light flash codes are used to indicate imminent loss of power, as indicated in Table 3.

Special power cables are available for accessing wheelchair batteries from standard recharge connector. These cables provide access to the battery voltage while maintaining clear access to the recharge connector. For connection directly to the battery stack, a cable is available with 5/16" (8mm)-ring terminations that can be attached to the battery connectors. *Please note, it is very important that any cable connected to a high capacity battery be fused.* In the case of the HeadMouse for Portables, this fuse should be a minimum of 5- and no more than 10-Amps.

The input power connector used by the HeadMouse is a standard 2.5-mm inner diameter coaxial connector and is illustrated in Figure 10.

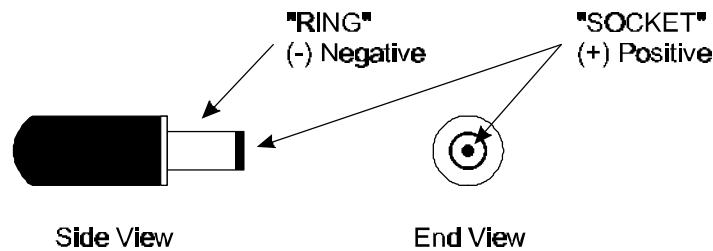


Figure 10. HeadMouse for Portables input power connector, inner diameter 2.5mm.

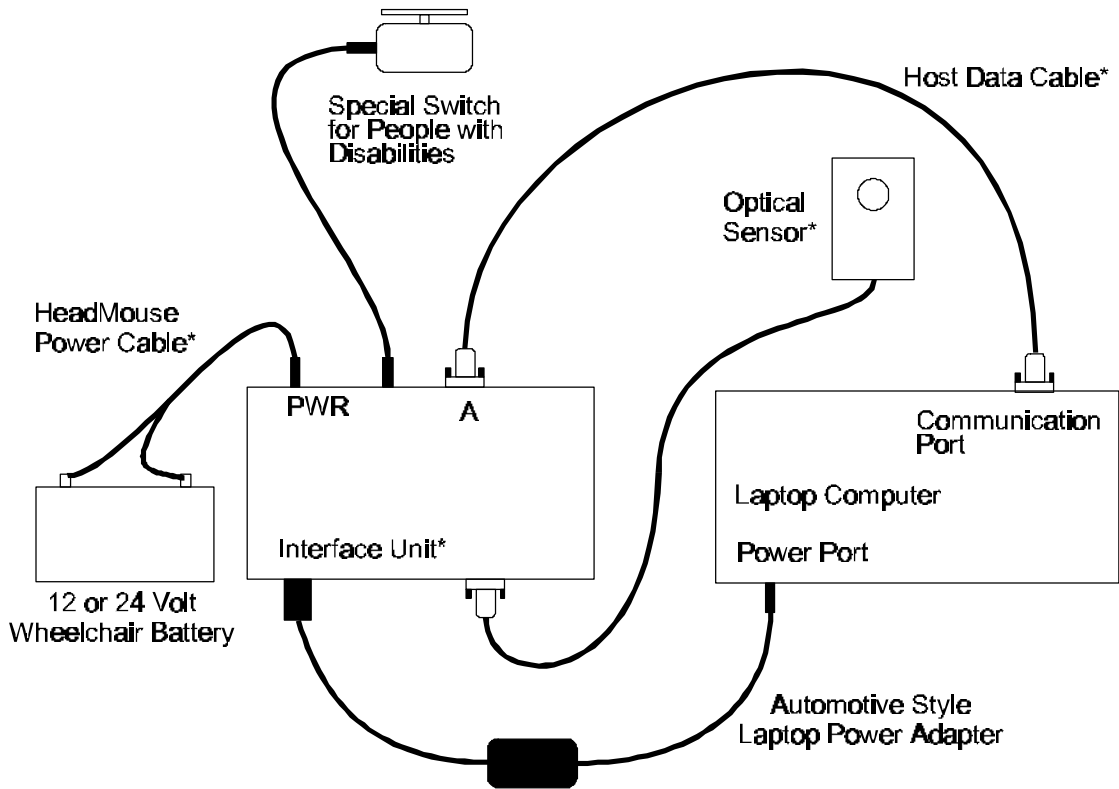


Figure 11. Wiring diagram for using HeadMouse for Portables with a 12- or 24-volt battery. The power cable attached to the battery must be protected by a fuse. (* - These items are supplied by or are optionally available from Origin Instruments.)

- Using the HeadMouse interface cable (9-pin, PS/2, ADB or USB), connect “PORT A” on the Interface Unit to the host computer port that is normally connected to your desktop mouse. *Please note that PS/2 devices should be connected to the host computer at boot time for proper initialization. If the PS/2 device is disconnected after initialization, it may not function again until it is re-initialized. See the appropriate wiring diagram and the Interface Unit rear panel illustration in Figure 12.*

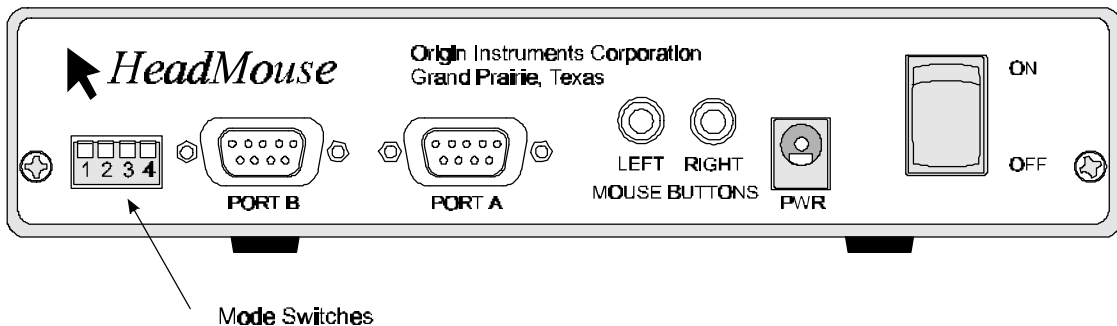


Figure 12. The Interface Unit rear panel. The factory defaults for the mode switches are switches 1, 3 and 4 down with switch 2 positioned appropriate for the specific HeadMouse Sensor, see Table 4.

5. Adaptive switch(es) if used, are connected directly to the 1/8" (3.5mm) microphone jacks on the Interface Unit rear panel. The "LEFT" and "RIGHT" mouse buttons are also commonly referred to as the primary and secondary mouse buttons, respectively.
6. Installation of the HeadMouse hardware for the "Standard" operating mode is now complete.
7. For "Teach" mode operation, connect a Microsoft compatible serial port mouse to PORT B, as shown in Figure 9. *Please note that the HeadMouse only detects the presence of a desktop mouse at the application of HeadMouse power. In the Teach mode, the HeadMouse will have control of the mouse pointer unless the desktop mouse is active – button clicked, button held, or mouse moving. After the desktop mouse is inactive for approximately two seconds, control will return to the HeadMouse.*

Target Dot Installation

The paper thin target dot is a special infrared reflector. The HeadMouse uses this dot to determine the position of your head and thereby directly control the computer mouse pointer. This adhesive backed target dot is typically attached to your forehead or glasses. As discussed previously, the Sensor must be able to see the target dot in order to function. Therefore, some people with long bangs or baseball caps may need to make some adjustments. It's very simple to determine whether you have a problem. While looking in a mirror, turn your head from side-to-side and up-and-down like you're controlling the HeadMouse. If you can still see the target dot during these movements, then so can the Sensor.

The illustrations in Figure 13 show how the target dot can be placed directly on the forehead or eyeglasses.



Figure 13. Options for placement of the HeadMouse target dot.

It is important to note that in the case of attaching the target dot to glasses, it should be attached to the frames and not directly to a lens. For best performance, persons with shiny metal frames should attach the target directly to the forehead, with the target dot positioned at least one inch above the frames. Target dot placement is only an issue regarding HeadMouse performance. The HeadMouse will not be damaged by any target

dot placement. For more information regarding target dot placement, please refer to the section on suitable environments below.

Suitable Environments

The HeadMouse operates using near infrared light energy; therefore, situations where bright sources of infrared light are within the field of view of the HeadMouse or which directly illuminate the user should be avoided. This does not mean that the HeadMouse will not operate correctly while in one or both of these situations, but that HeadMouse performance may degrade. The two most common sources of near infrared light are the sun and incandescent lamps. Light sources based on fluorescent lamps do not radiate a significant amount of near infrared light and therefore pose no interference problem.

Highly reflective objects placed adjacent to the HeadMouse target dot should also be avoided. In most cases there will be no problems associated with these objects (clutter) unless they are placed in the immediate vicinity of the target. Some who wear eyeglasses may also have problems with spurious reflections off the lenses or metal frame. These problems are best handled by moving the target away from the eyeglasses frame, or providing a diffuse mask behind the target. Spurious reflections from jewelry are usually not a problem, because these objects are typically located some distance away from the target. As a final resort to dealing with interference problems, the interfering objects, where feasible, should be removed from the immediate area.

Multiple HeadMouse systems may be used in the same neighborhood as long as the Sensors do not radiate *directly* into each other's field-of-view. If the Sensors are facing each other and are closer than about 30 feet (9 meters) there will probably be interference. However, multiple Sensors can have overlapping fields-of-view as long as one Sensor does not radiate directly into the receiver of another one. For instance, an installation could be set up such that two Sensors are positioned on adjacent computer systems. As long as the Sensors were oriented so that neither radiated directly into the receiver of the other, both would operate as if the other were not there.

Another potential interference source is self-induced and is almost always associated with reflections from objects very close to the HeadMouse. The most common object encountered is the top of the display. This problem shows up when the HeadMouse is improperly positioned back from the front edge of the display. In this position, the display's front ledge is in the HeadMouse Sensor's field-of-view and because it is so close the transmitted energy is reflected back at very high power levels. This will not damage the sensor; however, it will often prevent it from operating properly. Another situation that can cause self-induced interference occurs when the Sensor's front panel is oriented approximately parallel to a highly reflective and flat surface (e.g. mirror or plate glass).

Finally, objects that obscure the HeadMouse sensor's line-of-sight to the target dot must be controlled. Items that typically interfere with the sensor's line-of-sight are: people, parts of the user's body especially hair, hats, wiring, HeadMouse mounting fixtures, and furniture.

Chapter 3, Operation

In general, the HeadMouse for Portables operates in the following manner. Immediately after the application of power the system initializes itself, transitions into the search mode and begins looking for a target. The time required to acquire a valid target is less than a second. If no target is in the field-of-view, the sensor will continually search until one is acquired or until the power is turned off.

The HeadMouse responds to external inputs in a manner very similar to a standard desktop mouse. When the HeadMouse is not tracking a target dot or the target dot is stationary the HeadMouse does not send mouse information to the host computer. In other words, if the target dot (the user's head) does not move the on screen mouse pointer does not move.

The base HeadMouse emulates a standard Microsoft compatible desktop mouse as extended by Logitech. Mouse buttons are input using the two 1/8 inch (3.5mm) microphone jacks on the HeadMouse rear panel. See Chapter 1, for a description of the hardware and Chapter 2, for installation instructions.

The HeadMouse and Smart Cables will indicate which host computer port they are connected to by responding to queries from standard mouse driver software. Upon receiving these responses, which are the same as from a desktop mouse, the mouse driver software is loaded on the host computer. *However, the HeadMouse must be powered-up and properly connected for an appropriate response to take place.* After proper installation, the information received by the host computer from the HeadMouse will be indistinguishable from that received from a desktop mouse.

Operating Modes

The HeadMouse has two operating modes available to the user and they are listed in Table 5.

Table 5. HeadMouse Operating Modes.

Mode Number	Operating Mode
0	Standard
1	Teach

(HeadMouse automatically determines mode type at the application of power)

The HeadMouse automatically selects the operating mode based on what is connected to "PORT B". When a standard Microsoft compatible desktop mouse is connected to "PORT B" the HeadMouse takes this as an indication to enter the "Teach" mode at

power-up. When a desktop mouse is not connected to “PORT B” the HeadMouse will default to the “Standard” mode at power-up.

Many computers do not load the mouse driver software if a mouse is not attached to the appropriate port at boot time. If the HeadMouse is connected to the proper port, with power applied, it will cue the computer to load the mouse driver. When the HeadMouse is queried by the mouse driver and a Smart Cable is not attached, the HeadMouse also checks to see if a Microsoft compatible desktop mouse is connected to “PORT B” and if so, the HeadMouse enters the “Teach” operating mode.

Because the HeadMouse emulates a standard desktop mouse and uses the same mouse driver software, the host computer and mouse driver operate exactly the same as if a standard desktop mouse were in use. The fact that a HeadMouse is connected to the computer is transparent to both the application software and the computer.

Standard Mode: The HeadMouse or HeadMouse and Smart Cable provides direct, head-controlled mouse emulation using a data format compatible with the desktop mouse it replaces. The HeadMouse sends out mouse data packets in direct proportion to target movements in azimuth and elevation. Adaptive switch closures input to the HeadMouse rear panel connectors are used to emulate a press of the left and right mouse buttons. The Apple Macintosh mouse button is input to the HeadMouse as the left button.

Teach Mode: The HeadMouse or HeadMouse and Smart Cable provides direct, head-controlled mouse emulation using a data format compatible with the desktop mouse it replaces. The HeadMouse sends out mouse data packets in direct proportion to target movements in azimuth and elevation. Adaptive switch closures input to the HeadMouse rear panel connectors are used to emulate a press of the left and right mouse buttons. The Apple Macintosh mouse button is input to the HeadMouse as the left button.

In addition to head control of the on-screen mouse pointer the HeadMouse can operate in conjunction with a desktop mouse. To facilitate this functionality the HeadMouse has the capability to accept desktop mouse data and transmit it to the computer instead of data derived from head movements. The main advantages of this architecture are that only one connection is required to the computer and only one standard mouse driver is installed on the computer. The desktop mouse is connected directly to the HeadMouse “PORT B” as illustrated in Figure 9.

Multiple Apple Macintosh compatible mice can be connected to the ADB bus simultaneously; however, the HeadMouse should be the only mouse connected directly to the bus. The reason for this is all mice connected to the bus have additive control over the on-screen mouse pointer. Since a HeadMouse user cannot typically hold his head perfectly still a traditional mouse user will be constantly fighting the HeadMouse to maintain the position of the mouse pointer. This effectively renders the additional mouse unusable.

However, the solution is to use a desktop mouse that is filtered through the HeadMouse. Now the HeadMouse can manage the on-screen mouse pointer by allowing either the desktop mouse or the HeadMouse to control its on-screen position. Using this control model, during most times the HeadMouse will have control of the on-screen pointer. Only when the desktop mouse changes state does control of the pointer transfer to the desktop mouse. After the desktop mouse is idle for a duration of approximately two seconds, control will revert back to the HeadMouse.

This feature is designed to allow a person to instruct or collaborate with a person with disabilities using the same computer system and application software.

Chapter 4, Problem Solving

The HeadMouse for Portables is a permanently aligned and factory calibrated optical tracking system. The Sensor does not require user alignment or calibration for proper operation.

In the questions and answers that follow several issues associated with operation of the HeadMouse are discussed.

Frequently Asked Questions:

Q: Why does the status light indicate the HeadMouse is tracking when there is no target in the Sensor's Field-Of-View (FOV)?

A: There are several possibilities:

1. There really is a target in the Sensor's FOV, maybe one inadvertently stuck to something in your work area.
2. There is a mirror (or window) in the Sensor's FOV oriented approximately parallel to the Sensor's front panel. The transmitted light is being reflected directly back into the receiver.
3. There is some highly reflective item in the Sensor's FOV.
4. There is a *very* bright infrared source within the Sensor's FOV. This is unlikely because the sensor can reject all but the most intense infrared sources.
5. There is an object *very* close to, and in the field-of-view of, the Sensor's transceiver. This object is reflecting transmitted light back into the receiver at a very high level and causing interference. Reflected light will not harm the Sensor; however, it may impair its proper operation. Often this problem is associated with misplacement of the Sensor on the host computer or AAC device. Typically, the misplaced Sensor is positioned so that the top edge of the computer display is in the sensor's FOV. These near field reflections then cause self-induced interference. To correct this problem, position the Sensor so that there are no objects in an imaginary 50° circular cone that emanates from the dark circular window. An illustration of the Sensor's field-of-view is shown in Figure 7.

Q: Why does the status light sometimes change from red to green and back to red when an untargeted object transits the Sensor's FOV?

A: By passing through the Sensor's FOV the object has masked and unmasked an infrared source and the HeadMouse momentarily investigated to see if the source was clutter or a valid target. The Sensor is constantly searching for valid targets whenever it isn't tracking. It will sometimes transition into track mode

on a piece of clutter until it has had more time to investigate the validity of the source.

Q: Do the targets wear out?

A: Yes, with repeated handling (rubbing, deposition of debris, and application and removal) the efficiency of the targets will degrade. However, targets can be worn for several days and a person can sleep and shower while wearing one. Once consumed, replacement targets are available at a nominal charge from Origin Instruments.

Q: What happens when the HeadMouse is tracking and then quits tracking because it loses sight of the target?

A: The HeadMouse continues looking, for a brief period, in the immediate vicinity of the last known target position and if it doesn't recapture, it begins searching over its entire field-of-view.

Q: What happens when two valid targets are in the FOV at the same time?

A: The HeadMouse begins searching over its FOV and captures the target with the best return. The best return is usually from the target closest to the Sensor. If the HeadMouse is tracking a target and another valid target enters the FOV the HeadMouse will ignore the second one. If the HeadMouse loses track of the first target, for any reason, it will begin searching over its entire FOV and capture the target with the best return. If the second target is brought very close (within two to three target diameters) to the first target the tracking performance will be unpredictable. If the targets are brought very close together and then separated the HeadMouse will capture and track the one with the best return.

Q: What happens when two or more HeadMouse systems are tracking (irradiating) the same target; is there interference?

A: No, each Sensor will reject radiation from the other as if it were any other infrared clutter source. There is a discussion about using multiple HeadMouse systems in Chapter 2.

Q: How long does it take the HeadMouse to find a valid target?

A: Nominally the Sensor can search its FOV and begin tracking within a third of a second.

Q: How do I adjust the ratio of head (target) movement to mouse pointer movement?

A: Since the HeadMouse is just a mouse emulator its sensitivity is adjusted in the same manner as a standard desktop mouse. Open the mouse driver control panel and adjust the sensitivity as instructed in the documentation that came with your computer.

Q: Can I use the mouse buttons on the “Teach” mode desktop mouse to enter mouse button clicks for the HeadMouse?

A: No, if the desktop mouse is used to enter a click there will be a two second delay from the time the pressed button is released until the HeadMouse user once again has control of the on-screen pointer. Further, a drag operation is not possible, because control does not revert back to the HeadMouse until the desktop mouse button is released. Therefore, it is not practical to use this technique for entering mouse button “clicks”. Either use an adaptive switch connected to the “Mouse Button” connectors on the Interface Unit rear panel, or use a “dwell” selection utility such as AutoClick™. AutoClick is available in Origin Instruments’ on-screen keyboard known as SofType™ and mouse utility program known as Dragger™.

Q: Should I be concerned about water getting on the HeadMouse for Portables?

A: Yes, the safest course of action is to avoid all contact. However, light incidental contact should not be a concern. If either the Sensor or Interface Unit is soaked it should be allowed to thoroughly dry inside and out before power is applied. If it is immersed, please call Origin Instruments for instructions.

Power Adapter Questions

Q: Does it matter whether I use a 12- or 24-volt battery?

A: No, the HeadMouse for Portables can operate using either battery. In fact, the integrated power adapter measures the battery voltage and monitors it in order to determine when the battery is fully discharged. When the battery is fully discharged the integrated power adapter disables the accessory socket and shuts down the HeadMouse in order to prevent deep discharging the battery. This battery management is automatic and once the battery is recharged, the integrated power adapter restarts the HeadMouse.

Q: How do I connect the HeadMouse for Portables to my powered wheelchair?

A: There are several methods. Origin Instruments has several power cable options and there are others available from third party providers. One option is to connect directly to the battery terminals with a fused cable. A second option is to connect to the battery using the battery recharge port connector. A third option is to order a special power cable from the wheelchair manufacturer that provides access to the battery.

Please note it is very important that the cable from the battery be fused at some point. In a fault condition, wheelchair batteries can source very high currents, which can burn wire insulation and adjacent pieces of the wheelchair, and possibly the occupant.

Connection to the battery should be performed by a technically competent individual.

Q: How do I power the HeadMouse for Portables, if I have a manual wheelchair?

A: Simply obtain a fused 12- or 24-volt battery pack and plug it directly into the HeadMouse. Origin Instruments can provide such a battery pack, which includes a back-up AC power supply and charger. This battery pack will power the HeadMouse for nine to ten hours. If the accessory socket is supplying power to an external device then the operating time will vary according to the total current demand.

Q: Will it damage the Interface Unit if I accidentally reverse the input voltage polarity?

A: No, the Interface Unit is protected from voltage polarity reversal. The HeadMouse will not work, but it will not be damaged.

Q: Can I operate my HeadMouse for Portables from an automotive power port (cigarette lighter socket)?

A: Yes, contact Origin Instruments for the appropriate fused cable.

Q: Why must I be concerned about powering devices from the accessory socket when the AC wall transformer powers the Portable HeadMouse?

A: The AC wall transformer does not have the current capacity to drive external devices as well as the Portable HeadMouse. Powering external devices while running the Portable HeadMouse from the AC mains requires the optional Origin Instruments high current power supply.

Q: Why does the power adapter remove voltage from the accessory socket before disabling the HeadMouse?

A: The assumption is that many users will power their laptop computer from the accessory socket and therefore can use the computer's internal batteries when the external battery is almost discharged. If the accessory load is removed while some external battery capacity remains, the HeadMouse can continue operating. Assuming the laptop batteries are charged, this scenario should provide longer operating time.

Q: Will I be warned before the HeadMouse disables the accessory socket?

A: Yes, the status indicator will flash the green LED in five second bursts every 15 seconds for about three minutes before disabling the accessory socket.

Q: When the external battery is fully discharged, will I be warned before the HeadMouse shuts down?

A: Yes, the status indicator will flash the red LED in five second bursts every 15 seconds for about five minutes before removing power to the HeadMouse. This should be ample time to arrange for another source of power or to save any open files and gracefully shutdown the computer.

Q: Why should I be concerned about deep discharging my battery?

A: If the battery is discharged past the point of “full discharge” as defined by the battery manufacturer then the battery’s fully charged capacity will be decreased. Battery discharge past the point defined as fully discharged is known as deep discharging the battery. Each time the battery is deep discharged it will loose a little more capacity. At some point, the battery becomes unusable. This point is mainly a function of the depth of each deep discharge and number of deep discharge events. Even a handful of severe deep discharge events can render a battery unusable.

Chapter 5, Maintenance

Cleaning the HeadMouse Optics

Warning: The optical assembly is a factory aligned and calibrated unit. Field disassembly of the optical Sensor is *not* possible and if attempted will void the warranty.

Caution: The HeadMouse aperture is covered with a plastic window and as such is subject to damage. Use extreme care while attempting to clean the window.

To remove dust use a common lens brush or blower available from your local photographic supply store. Be sure to remove all grit before wiping the window with lens paper. Use clean, soft lens-paper moistened with mild soap and water or reagent alcohol and gently rub in a circular motion until the debris is removed. One should use the least amount of force required to remove the debris. Do not soak the sensor; use only enough liquid to lightly moisten the window.

If very stubborn debris is stuck to a window, try applying more moisture, to the debris, and allow it to soak into the debris. (*Do not soak or immerse the Sensor or Interface Unit.*) Once the debris is loosened, remove it; several treatments may be necessary. If the debris is firmly attached or if damage to the window has occurred, return the sensor to Origin Instruments for prompt repair.

Debris removal or damage caused by debris or its removal is not covered by the warranty.

Cleaning the Smart Cable

Warning: Field disassembly or immersion of a Smart Cable is *not* recommended and if damage occurs, it will void the warranty.

Caution: Smart Cables contain embedded electronics and can be damaged if immersed or subjected to severe mechanical abuse.

The Smart Cable does not require regular maintenance. If the Smart Cable becomes soiled, it may be cleaned using standard cleaners used on common plastics. However, as part of the cleaning process the Smart Cable should *not* be immersed or soaked.

Damage caused from immersing or soaking the Smart Cable is not covered by the warranty.

User Serviceable Parts

There are no user serviceable parts within the HeadMouse optical Sensor, Interface Unit, or Smart Cables. Origin Instruments or an authorized agent of Origin Instruments shall perform all service. *Service attempted by unauthorized personnel will void the warranty.*

Appendix A. HeadMouse for Portables Specifications

Optical Sensor Size:	Standard: 5.5 x 2.75 x 0.75 inches, (13.7 x 7 x 1.9 cm) Miniature: 3.4 x 2.75 x 0.75 inches, (8.5 x 7 x 1.9 cm) Cable Length: 72 inches (183 cm)
Interface Unit Size:	7.3 x 5.7 x 1.5 inches, (18.5 x 14.5 x 3.8 cm)
Operating Range:	10 to 48 inches, (25 to 122 cm)
Field of View:	50° Azimuth x 50° Elevation
Measurement Resolution:	0.01 inch Typical* (0.25 mm)
Measurement Rate:	30 Measurements per Second
Operating Wave Band:	Near Infrared
Standard Target:	0.006 inch, (0.15 mm) Thick by 0.25 inch (6.4 mm) Diameter, Adhesive Backed
Computer Interfaces**:	Serial Port, RS-232C With DB-9 Connector Apple Macintosh Smart Cable IBM PS/2 Smart Cable
Adaptive Switch Interface:	Two 1/8 inch (3.5 mm) Microphone Jacks
Power Consumption (HeadMouse):	7.5 watts
Input Voltage:	Accessory Socket disabled: 8- to 28-volts 12-volt SLA*** Battery: 10.5- to 15-volts 24-volt SLA Battery: 21- to 28-volts
Output Power† (Accessory Socket):	12-volt SLA Battery input: Input voltage -5% at 2.5 amps [†] Efficiency: 95% 24-volt SLA Battery input: 12-volts (± 5%) at 2.5 amps Efficiency: 85%

* Measurement parameters are RMS values and are quoted for 0.25 inch (6.4 mm) diameter target at 32 inches (81 cm) range under normal florescent room lights. Values will vary with operating range and target diameter, and to some extent with ambient illumination and target position in the field of view.

** The default communication link, which is a standard EIA-232 serial port, can be used by most IBM PCs and compatibles. Origin Instruments Smart Cables are available for communicating with personal computers from Apple Macintosh and with workstations from various manufacturers. These Smart Cables have microprocessors embedded in one of the connector housings that converts the HeadMouse data format to the Apple Macintosh or IBM PS/2 mouse formats.

*** Sealed Lead-Acid.

† Accessory socket is protected from over current by an automatically resetting thermal fuse. To reset the device main power must be removed from the Interface Unit and the fuse allowed to cool. Depending on overload severity and ambient temperature, reset could take several minutes.

‡ When the accessory socket is enabled and a nominal 12-volt source is connected to the Interface Unit input, the input voltage is switched onto the accessory socket. However, if the input

voltage falls below 11-volts or above 15-volts the voltage is removed from the accessory socket.

The HeadMouse emulates the Microsoft Mouse data format as extended by Logitech Corp. for three mouse buttons. For proper HeadMouse operation the host computer must install the appropriate mouse driver software.

Appendix B. Installation Guide for the DynaVox 3100, 2/2c or DynaMyte/3100

Set-up

Refer to Chapter 2, Installation for more detailed installation information.

Note: Be sure that both the HeadMouse and the DynaVox/DynaMyte are turned off before commencing your setup.

1. Remove the Sensor and Interface Unit from the box, taking care not to touch the dark optical window on the Sensor's front panel. Using the included Dual Lock pads, attach the Sensor to the display. Depending on what was ordered, you will have received a standard or miniature Sensor. The standard Sensor is typically used with the DynaMyte and is attached to the rear of the display. The miniature Sensor is typically used with the DynaVox and is attached to the front of the display. If you are using with a DynaVox 2/2c, a special mounting wedge is required. Refer to the Mounting Instruction Guide included with the mounting wedge. Be sure to set the mode switches on the HeadMouse Interface Unit appropriately for the Sensor orientation as described in Chapter One. Refer to Table 4.
2. Connect the Sensor cord to the Interface Unit as shown in Figure 9.
3. Locate the standard 9-pin serial cable included with the HeadMouse for Portables. Connect the male end to Port A on the back of the Interface Unit. Connect the female end to the serial port on the side of the DynaVox or DynaMyte.
4. Turn on the power to the HeadMouse. *(This must be done prior to turning on the power to the DynaVox or DynaMyte.)*
5. Turn on the power to the DynaVox or DynaMyte.

Setting the DynaVox/DynaMyte Selection Methods

The two selection methods that can be used with the HeadMouse for Portables are Touch Enter and Mouse Pause. Individuals who are using a switch to enter mouse clicks should use the Touch Enter selection method. Individuals who wish to use a dwell selection to enter mouse clicks should use the Mouse Pause selection method.

Touch Enter

1. Select the SETUP button. This will open the Setup menu.
2. Select the SELECTION METHOD button. Continue to select this option until TOUCH ENTER is displayed.
3. Select OK three times to close all of the menus.

Mouse Pause

1. Select the SETUP button. This will open the Setup menu.
2. Select the SELECTION METHOD button. Continue to select this option until MOUSE PAUSE is displayed.

3. Select the SELECTION METHOD CONTROLS to display the Mouse Pause menu.
4. Set the dwell time by using the LONGER or SHORTER buttons on the Pause Time Slider.
5. Select OK three times to close all of the menus.

Mouse Pause Rest Feature

The Mouse Pause selection method provides a means of activating messages by directing the mouse pointer to the specific message and pausing over the message. To eliminate the inadvertent activation of message buttons, individuals who use the HeadMouse for Portables in the Mouse Pause mode, can temporarily disable the Mouse Pause feature by creating a Mouse Pause rest button. On the DynaVox 2/2c or DynaMyte, this is done by creating a blank popup page. The DynaVox 3100 and DynaMyte 3100 already have a Mouse Pause rest button however, it is necessary to place it on a page or popup for easy access. Locate your device in the instructions that follow, and proceed as directed.

DynaVox 2/2c or DynaMyte

1. Select the SETUP button. This will display the Setup menu.
 2. Select EDIT PAGE.
 3. Select NEW PAGE.
 4. Select NEW POPUP. An empty popup appears in the middle of the screen.
 5. Press SELECT.
 6. Select POPUP. The Edit Popup Properties menu is displayed.
 7. Select RESIZE POPUP. All of the menus close revealing the entire popup.
 8. Touch, drag and release one of the corners to resize the popup as appropriate.
- Hint: To change the background color of the popup, select POPUP COLOR; then select one of the color blocks in the Select Color menu.*
9. Select OK to close the Edit Popup Properties menu.
 10. Select ADD BUTTONS.
 11. Select ADD 1 SYMBOL BUTTON. A shadow outline of a button will appear in the popup.
 12. Touch, drag and release the button outline to position it in the popup. The Edit Button menu will be displayed.
 13. Select MODIFY.
 14. Select CHANGE BUTTON TYPE.
 15. Select COMMAND BUTTON to display the Modify Command Button menu.
 16. Select MODIFY COMMAND to display to Select Command menu.
 17. Select the CLOSE POPUP button.

18. Select OK.

Hint: Use Resize to make the Close Popup Command button smaller.

Use the Move Button option to reposition the popup button.

Select Edit Style to modify the button color, border, or symbol.

Select Options (within the Edit Style menu) to make additional changes to the button.

19. Select OK twice to close the Edit Button menu and Edit Page menu

20. Select YES to save page.

21. Type a name for the popup from the System Keyboard window.

22. Select OK to save the named popup.

23. Select the CLOSE POPUP COMMAND button to close the popup.

DynaVox 3100 and DynaMyte 3100

It is not necessary to create a Mouse Pause Rest Button on the DynaVox 3100 and DynaMyte 3100 as these devices already contain this feature. However, it is necessary to place the button on a page or popup for easy accessibility. Do so as described in the following steps.

1. Move to the page or popup where the Mouse Pause Rest button will be placed.
2. Select the SETUP pushbutton.
3. Select EDIT PAGE.
4. Select the button to be modified. The Edit Button menu will be displayed.
5. Select MODIFY. (If the Modify Command Button menu appears, skip steps 6 & 7 and continue with step 8.)
6. Select CHANGE BUTTON TYPE.
7. Select COMMAND BUTTON.
8. Select MODIFY COMMAND.
9. Use the Scroll buttons or the Command Search button to locate the Mouse Pause Command.
10. Select Mouse Pause.
11. Select OK three times.
12. Select YES when asked to save changes to the page.

The Mouse Pause Rest button should now be on the page or popup.

Setting the DynaVox/DynaMyte Mouse Speed

The Mouse Speed describes the amount of physical mouse (head) movement, versus the amount of pointer movement on the screen. In other words, decreasing the mouse speed would require more head movement to move the pointer across the screen while increasing

the mouse speed would require less head movement. Increasing the mouse speed also increases its sensitivity and would therefore require better head control to hold the pointer on its target area. The appropriate mouse speed setting will vary depending on the individual however, in most cases the mouse speed will be increased to at least $\frac{3}{4}$ up the indicator bar. Adjust the mouse speed settings for your device as indicated below.

DynaVox 2/2c or DynaMyte

1. Select the SETUP button. This will open the Setup menu.
2. Select MISC SETTINGS.
3. Select DEVICES.
4. Select MOUSE SPEED.
5. Use the FASTER/SLOWER buttons to set the X and Y speed.
6. Select OK four times to close all the menus.

DynaVox 3100 or DynaMyte 3100

1. Select the SETUP button. This will open the Setup menu.
2. Select INPUT/OUTPUT DEVICE SETTINGS.
3. Select MOUSE SPEED.
4. Use the FASTER/SLOWER buttons to set the X and Y speed.
5. Select OK three times to close all the menus.

Appendix C. Installation Guide for the Freestyle

Set-up

Refer to Chapter 2, Installation for more detailed installation information.

Note: Be sure that both the HeadMouse and the Freestyle are turned off before commencing your setup.

1. Remove the Sensor and Interface Unit from the box, taking care not to touch the dark optical window on the Sensor's front panel. Using the included Dual Lock pads, attach the Sensor to the display. Depending on what was ordered, you will have received a standard or miniature Sensor. The miniature Sensor is typically used with the Freestyle and is attached to the front of the display on either side of the Freestyle's infrared lens. Be sure to set the mode switches on the HeadMouse Interface Unit appropriately for the Sensor orientation as described in Chapter One. Refer to Table 4.
2. Connect the power cord included with the Freestyle into the end of the Freestyle power adapter then plug the power cord into a three-hole grounded outlet or power strip. Connect the power adapter to the Power Adapter Port located on the top of the Freestyle.
3. Using the ADB Smart Cable shipped with the HeadMouse, connect the serial (DB-9) end to Port A on the HeadMouse Interface Unit. The round, 4-pin, ADB connection attaches to the ADB port located in the Port Compartment on the top of the Freestyle.
4. Connect the AC power adapter included with the HeadMouse to the power port located on the HeadMouse Interface Unit.
5. Using the dual-lock provided with the HeadMouse, attach the HeadMouse Optical Sensor to the front of the Freestyle on either side of the infrared lens. The sensor cord should extend from the top of the Optical Sensor. Connect the sensor cord to the front of the HeadMouse Interface Unit.
6. A desktop serial mouse is included with the HeadMouse for using in Teach Mode. Connect the desktop mouse to Port B on the HeadMouse Interface Unit.
7. Turn on the power to the HeadMouse. (***Be sure to turn on the HeadMouse prior to turning on power to the Freestyle.***)
8. Turn on the power to the Freestyle. The power Key button is located on the right side of the front of the Freestyle.

Setting Companion Software Dwell Selection

Companion's dwell selection method provides a means of activating buttons by directing the mouse pointer to the specific button and pausing.

1. Double click on the Companion Folder to open it.
2. Extend the Go toolbar bar by clicking on the down arrow.
3. Select the Preferences button to open the User Preferences screen.

4. To open the Input Method Alt Pointer screen, select Alternative Pointer.
5. Select the desired dwell time, Long, Medium or Short. The numeric setting for each of these dwell selection can be adjusted from the Fine Tune Input screen as follows:
 - a) Select the Fine Tune button on the Preference toolbar.
 - b) Under Dwell, select from Preview, Execute or Both to determine which action the dwell time is being set for.
 - c) Specify the dwell time in number of ticks. (A tick is 1/60 of a second, so 60 ticks is equal to 1 second.
6. Select DONE on the Preference toolbar after all adjustments have been made.

Rest Feature

To eliminate the inadvertent activation of buttons, individuals who use the HeadMouse for Portables with Companion's dwell selection feature, can temporarily disable this feature by selecting the Stop button located on the Go toolbar. After the Stop button has been selected, a Go button will appear on the screen which will enable the dwell selection feature again. The Go button will remain dwell sensitive at all times.

Setting the Mouse Speed

The Mouse Speed describes the amount of physical mouse (head) movement, versus the amount of pointer movement on the screen. In other words, decreasing the mouse speed would require more head movement to move the pointer across the screen while increasing the mouse speed would require less head movement. Increasing the mouse speed also increases its sensitivity and would therefore require better head control to hold the pointer on its target area. The appropriate mouse speed setting will vary depending on the individual however, in most cases the mouse speed should be increased to for optimal use of the HeadMouse with the Freestyle. Adjust the mouse speed settings as indicated below.

1. Select the Apple menu to the left of the Freestyle Menu Bar at the top of the screen.
2. Select Control Panels from the menu list.
3. Select Mouse.
4. Set the desired mouse speed.
5. Close the Mouse Window.

Appendix D. Installation Guide for the Vanguard and Pathfinder

Set-up

Refer to Chapter 2, Installation for more detailed installation information.

Note: Be sure that both the HeadMouse and the Vanguard/Pathfinder are turned off before commencing your setup.

1. Remove the Sensor and Interface Unit from the box, taking care not to touch the dark optical window on the Sensor's front panel. Using the included Dual Lock pads, attach the Sensor to the display. Depending on what was ordered, you will have received a standard or miniature Sensor. The miniature Sensor is typically used with the Vanguard and Pathfinder; it attaches to the front of the display. Be sure to set the mode switches on the HeadMouse Interface Unit appropriately for the Sensor orientation as described in Chapter One. Refer to Table 4.
2. Locate the standard DB-9 serial cable included with the HeadMouse for Portables. Connect the male end to Port A on the HeadMouse Interface Unit. Connect the female end to the multi-switch port located at the top of the Vanguard or the joystick port on the Pathfinder.
3. Turn on the power to the HeadMouse. (*Be sure to turn on the HeadMouse prior to turning on power to the Vanguard/Pathfinder.*)
4. Turn on power to the Vanguard/Pathfinder.

Setting the Vanguard/Pathfinder Selection Method

1. Select the Tools key located at the top right corner of the Vanguard/Pathfinder case.
2. Choose the Selection Technique menu.
3. Select Headpointing.

Setting the Dwell Time

4. Adjust the acceptance time (dwell time) as appropriate for the user.

Setting the Mouse Speed

The Mouse Speed describes the amount of physical mouse (head) movement, versus the amount of pointer movement on the screen. In other words, decreasing the mouse speed would require more head movement to move the pointer across the screen while increasing the mouse speed would require less head movement. Increasing the mouse speed also increases its sensitivity and would therefore require better head control to hold the pointer on its target area. The appropriate mouse speed setting will vary depending on the individual however, in most cases the mouse speed should be increased for optimal use of the HeadMouse with the Vanguard/Pathfinder. Adjust the mouse speed as indicated below.

5. The mouse speed can be adjusted using the Horizontal and Vertical Adjust options in the Selection Technique menu.
6. Select OK to close the Selection Technique menu.

Setting the Rest Feature

The Headpointing selection method provides a means of activating messages by directing the mouse pointer to the specific button and pausing. To eliminate the inadvertent activation of buttons, individuals who use the HeadMouse for Portables in the Headpointing mode, can temporarily disable the dwell feature by using the Disable Headpointer tool. This is a tool that must be stored in an icon sequence on the user's core vocabulary.

1. Select Tools.
2. Select Store Core.
3. Select Icon Sequence.
4. Select Spell Text to Message.
5. Select Insert Tool.
6. Select Disable Headpointer.
7. Make any desired changes to the icon picture or label at this time.
8. Select OK.

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