



NEUTRON EMC LAB.



FCC ID:F2Q4NE9ØTBNET

Attachment

User's Manual

LIBRA 90 NET TRACKBALL SPECIFICATIONS

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QTRONIX®

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I SCOPE

The purpose of this specification is to define the generic operational, environmental, electrical and mechanical characteristics of the "QTRONIX" opto-mechanical "TRACKBALL".

II GENERAL

Description

The Libra 90 Net trackball is design for use with the Pentium above compatible computers with a USB port Fully reversible for right or left handed users , it is a three button. Two buttons emulate the two buttons of a Microsoft Mouse or PS / 2 (PDP) and the middle button acts as a " special – function selector" Also it is 200 dot per inch (DPI) or 0.013mm / count opto-mechanical trackball. A built in micro processor, uses multiple rotary optical encoders and a rubber coated ball to detect trackball movements Count signals are sent to the host computer where they are translated into motion of the display screen cursor. The interface protocols are provided as follows.

- Three Button –USB Trackball .

The interface connection consists of four (4)USB-A plug connector, using USB output for Pentium above PC which support USB function.

Appearance / Durability

This products designed to be attached to the side of any notebook PC keyboard. And not only is it perfect for attachment to a notebook , the trackball also detaches from its mount for use as a free standing desk top trackball or for convenient and comfortable use held lightly in the hand. And it will be used in home and office environments, therefore, the quality of appearance and touch are of great importance. Because of the environmental severity of the home and office place. Longevity, durability and resistance to contamination are also of major concern. Good engineering design practices shall be followed throughout, both mechanically and electrically .

Order of Precedence

Where a conflict exists between the requirements of this document and those of referenced documents, this specification shall take precedence .

Definitions

The term "TRACKBALL " when used in this document defines a PC board with one or more switches and positional tracking circuits which is fully assembled and housed in an enclosure with interconnecting cable. The complete assembly shall be tested any ready for use when plugged into a host device.

III ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating

The operating temperature range shall be from 0°C to 50°C (32°F to 122 °F). There shall be An operational temperature test of a single cycle, ambient, cold, hot, ambient, With a minimum of a 15 minute dwell (pause) for every 15°C increment of change. The rate of temperature change shall not exceed 20°C per hour. The keyboard will operate normally throughout the cycle requiring no operator Intervention or corrective actions, except to cause normal movement.

Non-Operating

The non-operating temperature range shall be from -10°C to 60°C (14°F to 140°F). There Shall be a thermal shock test of five(5) cycles from -15 °C to 55°C holding for 30 minutes at each extreme. The rate of temperature change shall not exceed 25°C per hour. Normal keyboard operation will be verified before and after the thermal shock text.

Humidity

Operating

The operating relative humidity range shall be from 10% to 85% non condensing ambient temperature.

Non-Operating

The non-operating relative humidity range shall be from 10% to 85% non- Condensing. The keyboard shall withstand an environment varying between 25°C and 55°C, 85% relative humidity, non condensing, for a period of 96 hours.

Vibration Test

Operating

1. 5 to 31 Hz : 0.38mm peak to displacement.
Continuous logarithmic rate of 0.5 octave / minute up and back.
2. 32 to 500 Hz : 0.75 force limitation.
Continuous logarithmic rate of 0.5 octave / minute up and back.
3. 5 to 500 Hz Random Vibration : $0.01G^2$ / Hz for 30 minutes.
Continuous logarithmic rate of 0.5 octave / minute up and back.

Shock Test

The trackball shall withstand a shock equal to 20G forces, half sine wave for 11 msec duration in all three (3) orthongonal axes.

RFI / EMI

The trackball shall meet the requirements of FCC Part 15 for Class B Computing Devices.

ESD

For OEM level special request only :

3KV testing

Trackball or host device shall sustain no component damage. Loss of trackball or host device data memory, trackball program re-initialization or runaway shall not exceed a 6% error rate (94 cut of every 100 ESD impacts to a specific point will not produce an error).

5KV testing

Trackball errors or faults that require any operator intervention to either the trackball or the host device are not permitted.

8KV testing

This test is requires only of the trackball has an ESD shield as part of the design. The trackball or host device shall sustain no component damage.

Contaminants

Dust

The trackball shall be unaffected by the normal accumulation of airborne dust as found in the home or office place. This includes non-metallic dust and grime as might be carried into the work place or home from outside sources. Routine cleaning of necessary mechanical components is facilitated through easy access to those mechanical.

Gases

The trackball shall not be corroded or defaced or otherwise damaged by atmospheres acceptable to OSHA standards for the home and work place. This includes normal amounts of oxygen and ozone.

IV MECHANICAL SPECIFICATIONS

Materials

General

1. TRACKBALL BASE, COVER, MOUNT, WHEEL AND KEYTOP:
Injection molded ABS Thermoplastic rates UL 94HB or better.
2. PC BOARD : Paper Phenolic . Rated UL-94V ϕ .
3. SWITCH HOUSING : Thermoplastic.

Interconnect Cable

- Jacket: Low durometer PVC, 2.5mm to 4.1 mm nominal diameter.
- Shield : Braided shield with 90% $\pm$ 5% coverage.
- Conductor Insulation : PVC, polypropylene or Teflon.
- Pull Test : Cable shall be permanently secured to trackball housing and connector shell both shall withstand a 3kg force applied parallel to cord entry plane for ten (10) seconds.

Standard Connector

- USB-A plug
- Connector shell: Shielded, Plastic plated, metallic with contact dimples.
- Insulator: Thermoplastics.
- Contacts: Tin flash plated with a minimum of 15 micro-inches in contact area.
- Flex and Strain Relief: PVC.
- Backshell : Molded PVC.

Switch

- Type: Momentary with tactile and audible feedback.
- Contact Configuration : SPST.
- Pretravel : 0.25-1.3mm
- Hysteresis : 0.04-0.18mm
- Contact Bounce : Switch shall have electronically debounced contacts
- Actuation Force : 28 – 114GM
- Electromechanical Life : One million cycles at 3 cycles / second with a vertical actuation force of 114 GM.

Weight

The weight shall be 195 grams or less.

Workmanship

The trackball shall be uniform in workmanship and appearance. There shall be no nicks scratches , burrs or defects in material that may affect the function , serviceability or appearance of the trackball.

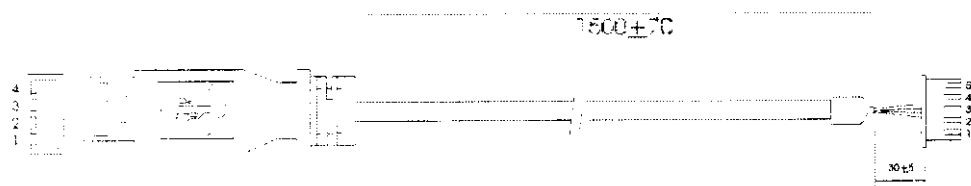
Maximum Dimentions

Height : 60mm

Length : 140mm

Width: 119mm

Cable Specification



V ELECTRICAL SPECIFICATIONS

Components

All component will be of the highest commercial grade and shall be mounted according to IPC and recommended vendor practices. Standard values are to be adhered to at all times . Single sources, unusual values or designs outside specified component ratings shall be avoided.

PC Boards

PC Board shall be made of UL (Underwriters Laboratories) rated material, 94V-0 or better as per UL 478.Each PCB Board will have an approved UL manufactures logo visible on one side.

Design Practice.

All components shall perform well within their design ratings. Good IC design with respect to unused inputs and number of outputs shall be observed. Trace width and spacing shall be conservative wherever possible and shall meet IPC minimums at all times. By pass capacitors shall be used liberally and some on-board filtering is expected when possible . Power consumption shall be minimized.

Reset

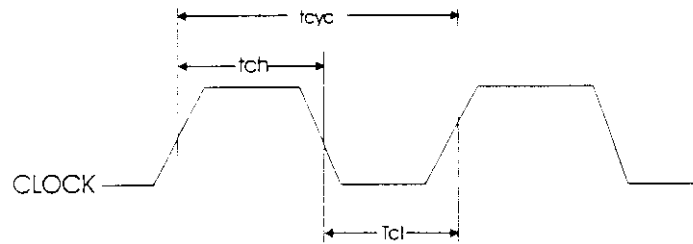
The trackball shall reset on power up . The power supplied to the trackball shall have a rise time of less than 100 msec.

Operation voltage and current consumption

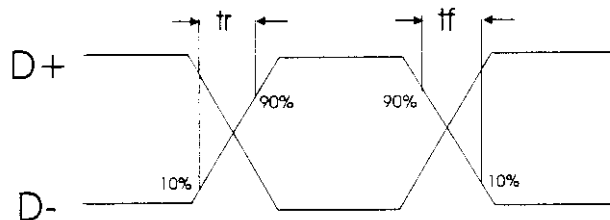
Parameter	Min	Typ	Max	Unit
Operating voltage	4.0	5.0	5.25	V
Operating current(no load) @6MHz	--	--	50	mA
X1, X2, Y1,Y2 input reference current	70	--	106	uA
X1,X2,Y1,Y2 sink current (O) lowest current	0.1	--	0.3	mA
X1,X2,Y1,Y2 sink current (F) highest current	0.5	--	1.5	mA
USB Interface VOH ,static output high	2.8	--	3.6	V
USB Interface VOL,static output low	--	--	0.3	V

Data format

Parameter	Description	Min	Max	Unit
tcyc	Input click cycle time	165.0	168.3	ns
tch	Clock high time	$0.45tcyc$	--	ns
tcl	Clock low time	$0.45tcyc$	--	ns
tr	Transition rise time	75	300	ns
tf	Transition fall time	75	300	ns



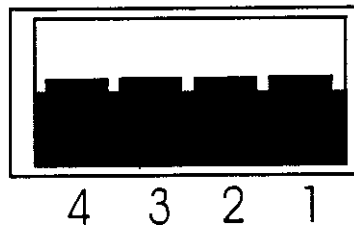
Clock Timing



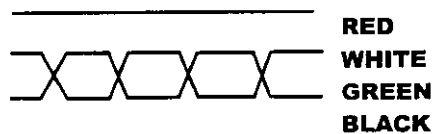
USB Data signal Timing

Connector Pin Assignments

The standard connector pin out for USB-plug is as follow:



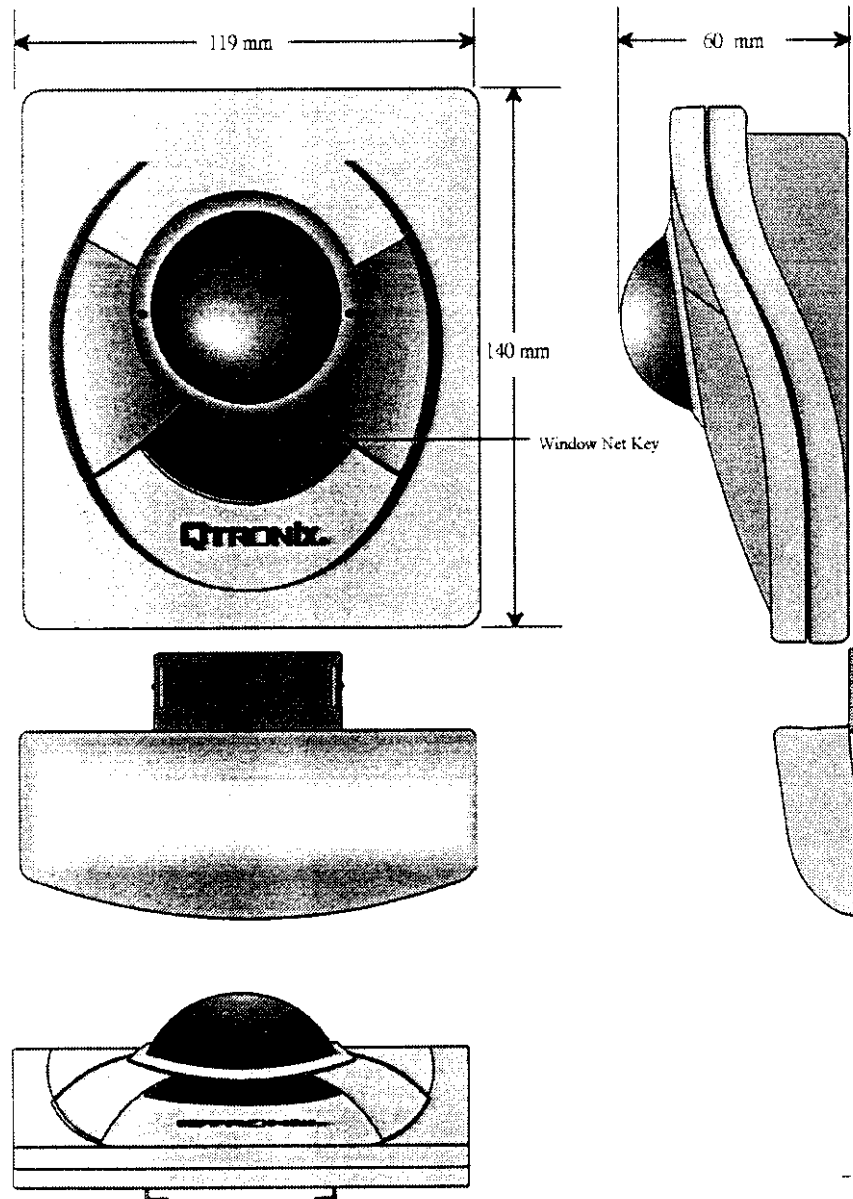
WIRING DIAGRAM



Window Net Function –Scroll & Enlarge

The Window Net function is useful in some applications where you want to scroll page / Down / Left / Right and enlarge. Perform the following steps:

- Install the Scroll-In-Mouse program first and reboot PC
- Press middle button on the trackball one time.
- Move the ball as you want to control the scrolling direction .To release the operating of scrolling just press the middle button again(refer to illustration of below).
- Press Ctrl + Middle button, will have a enlarge lens press middle button again ,will release the function.



VI . QUALITY ASSURANCE PROVISION

GERNERAL

The supplier agree to have a quality and manufacturing plan, include a data collection / tracking reporting system, that will assure all phases of design, procurement, fabrication, assembly and test of each Trackball manufactured in accordance with this specification. Supplier is solely responsible for the quality of the Trackball and or components procured or manufactured for Buyer.

SUPPLIER QUALITY PROGRAM SCOPE

The supplier quality program will control all aspects of the acquisition, storage, handling Of all materials, fabrication, assembly, test, inspection ,packaging and shipment of Trackball assemblies in accordance with this specification.

WARRANTY PERIOD

Should the Trackball fail to perform its intended functions described with this specification during the Trackball warranty period of 12 months from date of receipt. Said Trackball may be returned for repair.

CONFIGURATION CONTROL

Supplier shall give Buyer written notice thirty (30) days prior to implementing any technological or process change which may affect form, fit or function characteristics of any Trackball covered by this specification. In the event of such a change Buyer shall have the right to request a first article for preview and acceptance or rejections of the proposed change the supplier shall continue to manufacture and supply product at the previously agreed upon specification.

WARNING

Note : This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

Notice:

- (1) Use only shielded cables to connect I/O devices to this equipment.*
- (2) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*