

**SECTION X - TECHNICAL SPECIFICATIONS**

**1. REFERENCE STATION**

<b><u>SPECIFICATIONS</u></b>	<b><u>PROVIDED</u></b>
<p><b><u>RECEIVER</u></b></p> <p><b><u>SATELLITE TRACKING</u></b></p> <ul style="list-style-type: none"> <li>• 6 GNSS chipsets for a total of 220 channels</li> <li>• EVEREST TM multipath signal rejection</li> <li>• High precision multiple correlator for GNSS pseudorange measurements</li> <li>• Very low noise GNSS carrier phase measurements with &lt;1 mm precision in a 1 Hz bandwidth</li> <li>• Current satellite signals tracked simultaneously:               <ul style="list-style-type: none"> <li>– GPS: L1 C/A, L2C, L5</li> <li>– GLONASS: L1 C/A and unencrypted P code, L2 C/A 1 and unencrypted P code</li> <li>– Galileo GIOVE-A and GIOVE-B</li> <li>– SBAS: L1 C/A, L5 supporting WAAS,</li> <li>– L-Band OmniSTAR VBS, HP and XP EGNOS and MSAS</li> <li>– L5 full wavelength carrier</li> </ul> </li> </ul> <p><b><u>POSITIONING PERFORMANCE</u></b></p> <p><b>1. Code Differential GNSS Positioning</b></p> <ul style="list-style-type: none"> <li>• Horizontal . . . . . 0.25 m + 1 ppm RMS</li> <li>• Vertical . . . . . 0.50 m + 1 ppm RMS</li> <li>• differential positioning accuracy 3 . . . . typically &lt;5 m 3DRMS</li> </ul> <p><b>2. Static and fast static GNSS Surveying</b></p> <ul style="list-style-type: none"> <li>• Horizontal . . . . .2.5mm +1ppm RMS</li> <li>• Vertical . . . . .5mm +1ppm RMS</li> </ul> <p><b>Single Baseline &lt;30 km</b></p> <ul style="list-style-type: none"> <li>• Horizontal . . . . . 8 mm + 1 ppm RMS</li> <li>• Vertical . . . . . 15 mm + 1 ppm RMS</li> </ul> <p><b>3. Networked RTK</b></p> <ul style="list-style-type: none"> <li>• Horizontal . . . . .8 mm + 0.5 ppm RMS</li> <li>• Vertical . . . . .15 mm + 0.5 ppm RMS</li> <li>• Initialization time . . . . .typically &lt;30 seconds</li> <li>• Initialization reliability . . . . typically &gt;99.9%</li> </ul> <p><b><u>DATA STORAGE</u></b></p> <ul style="list-style-type: none"> <li>• On board memory.....1GB</li> <li>• External SD card.....standard 8GB</li> <li>• Logging rate .....50 HZ</li> </ul>	



- File Format.....BINEX
- File naming option.....multiple
- Data retrieval and transfer.....Network download
- Data Management.....Cycle storage

**Communication**

• **Ethernet**

- Integrated RJ45 jack
- Full-duplex, auto-negotiate 100Base-T
- Power over Ethernet (PoE) support with a Class 3 PoE supply  
HTTP, NTRIP
- 10 TCP/IP Data stream at the same time
- 1GSM antenna port for GPRS wireless communication.
- Wireless.....GPRS/CDMA
  - Proxy server support
  - Routing table support
  - NTP Server, NTP Client support

• **DATA FORMAT**

- -Correction format.....sCMRx,CRM+ ,RTCM2.1 to RTCM3.1
- Observables.....ZHD,RINEX,BINEX
- Position/status I/O.....NMEA-0183 v2.30

**PHYSICAL SPECIFICATIONS**

- Weight ..... 1.75 kg (3.85 lb)
- Dimensions (L x W x H) ..... 26.5 cm x 13.0 cm x (10.43 in x 5.12 in x 2.16 in)
- Humidity..... 100%
- Water proof.....Dustproof,protected from immersion to depth of 1M

**ELECTRICAL**

- Power 7-32 DC input
- Power consumption 4w
- 200 hours continuous work by 93 Ah accumulator
- Integrated internal battery
- Internal battery to act as UPS in Event of a power outage
- Seamless switching between external and internal power source

**ANTENNA SUPPORT**

- **Output voltage** ..... 5.0 V DC nominal
- **Maximum output current** ..... 150 mA
- **Maximum cable loss** ..... 12 dB

**SECURITY**

- Optional HTTP login
- HTTPS
- Real-time stream authentication
- Programmatic interface authentication
  - Real time stream authentication
  - Multilevel access Control
  - SSL authentication

**SPECIFICATIONS**

**PROVIDED**

**GNSS ANTENNA**

**PERFORMANCE**

- Broad GNSS Frequency Tracking Band:
  - GPS: L1, L2, L5
  - GLONASS: L1, L2, L3
  - Galileo: E1, E2, E5, E6
  - SBAS: WAAS, EGNOS, QZSS, Gagan, MSAS, and Omni Star
- **signal tracking**..... below 5 degrees
- **Antenna gain at zenith**..... 5.5dBi
- **Phase –Centre accuracy**.....2mm
- **Phase –Centre repeatability**.....<1mm
- **Maximum Phase –Centre eccentricity**.....2mm
- **LNA Gain** .....43db
- **Antenna feed** .....Four point for phase center stability and enhanced polarization
- **Female signal connector**..... TNC
- **Sectional area**... Small cross to reduce wind loading
- **Amplifier** .....13 dB margin supporting a cable to 60 m without special coaxial cable or in-line amplifiers
- **North orientation**..... marking on exterior
- **Signal gain** .....50 dB for reliable tracking in difficult environments
- **Power consumption** .....Low voltage, low
- **Mount point**.... 5/8" x 11 female threaded stainless steel
- **GNSS receiver** .....Powered by via coaxial cable



• **Low noise amplifier** .....Advanced LNA.

**Hardware**

**Dimensions** ..... 34.3 cm diameter x 7.6 cm height  
(13.5 in diameter x 3 in height)

**Weight** ..... 1.36 kg (3 lb)

**Operating Temperature**..... -40 oC to +70 oC  
(-40 oF to +158 oF)

**Humidity**..... 100% humidity proof, fully sealed

**Shock and Vibration**

**Shock** ..... to survive a 2 m (6.56 ft) drop onto  
concrete

**Vibration**..... MIL-STD-810-F on each axis

**Input Voltage**..... 3 V DC to 18 V DC

**Input Current**..... 45 mA maximum



<u><b>SPECIFICATIONS</b></u>	<u><b>PROVIDED</b></u>
<p><u><b>CONTROLLER</b></u></p> <p><u>POLE</u></p> <ul style="list-style-type: none"> <li>• Carbon fiber monopole rod and range pole bracket</li> </ul> <p><u>SYSTEM</u></p> <ul style="list-style-type: none"> <li>• Windows Mobile version 6.0 software</li> <li>• 806 MHz XScale processor</li> <li>• 128 MB DDR SDRAM</li> <li>• 1 GB non-volatile Flash storage</li> <li>• Secure Digital (SDIO) memory card slot</li> <li>• CompactFlash (CF) (Type II) slot</li> <li>• Integrated Bluetooth 2.0</li> <li>• USB Boot with USB-host, and audio jack</li> <li>• VGA display (480 x 640), sunlight-readable color touchscreen</li> <li>• Integrated speaker and microphone</li> <li>• Notification LEDs</li> <li>• 15 hour battery life with active use (default settings)</li> <li>• Numeric style keypad</li> <li>• Audio jack</li> </ul> <p><u>Standard Software</u></p> <ul style="list-style-type: none"> <li>• GPS Controller for controlling NMEA output and in-field mission planning</li> <li>• Microsoft Office Mobile</li> <li>• Transcriber (handwriting recognition)</li> </ul> <p><u><b>Technical Specifications</b></u></p> <p><u>Physical</u></p> <ul style="list-style-type: none"> <li>• Size . . .17.6 cm x 10.0 cm x 5.0 cm (6.92 in x 3.92 in x 1.96 in)</li> <li>• Weight. . . . . 558 g (1.23 lb) including rechargeable battery</li> <li>• Processor. . . . . 806 MHz XScale processor</li> <li>• Memory. . . . . 128 MB RAM and 1 GB Internal Flash Disk</li> <li>• Battery. . . . . Field swappable 5200 mAh Li-Ion rechargeable battery</li> </ul> <p><u>Environmental</u></p> <ul style="list-style-type: none"> <li>• Operating temperature . . . . . -30 °C to +60 °C (-22 °F to +140 °F)</li> <li>• Storage temperature . . . . . -40 °C to +70 °C (-40 °F to +158 °F)</li> <li>• Humidity . . . . . MIL-STD-810F,</li> <li>• Sand and dust. . . . . IP67, MIL-STD-810F</li> </ul>	





- **Expansion** . . . . . 1x SDIO slot, 1 × Type II CF slot
- **Display** . . . . . 480 x 640 pixel (VGA) 16 bit color TFT with LED backlight
- **Interface** . . . . . Touch screen, backlit hardware control keys
- **Audio system** . . . . . events, warnings, and notifications
- **Soft Input Panel (SIP)** . . . . . virtual keyboard and handwriting recognition software, power status LED
- **Audio** . . . . . Mono speaker, unidirectional microphone speaker

Record and playback utilities

- **I/O** . . . . . USB host and client, power, audio jack
- **Radios** . . . . . Bluetooth 2.0+ EDR, 802.11 b/g wireless LAN WPA2

GPS

- **Channels** . . . . . 12 (L1 code only)
- **Update rate** . . . . . 1 Hz
- **Time to first fix** . . . . . 50 seconds (typical)
- **Protocols** . . . . . SiRF, NMEA-018
- **Accuracy** (Hr MS) after differential correction
- **Code Post processed** . . . . . 2–5 m

**DESKTOP SOFTWARE SHOULD SUPPORT**

- GLONASS post processing for data collected with GLONASS- enabled GNSS receivers

GNSS accuracy

- differential post processing capability, including GLONASS post processing
- Post process real-time differential GNSS data capability to improve accuracy and consistency
- Capable of reviewing and editing GNSS data before transferring it to a GIS

GIS compatibility

- Import data from popular GIS, CAD, and database formats
- Export data into a variety of GIS, CAD, and database formats
- Create data dictionaries to ensure data collected is consistent with GIS schemas

Web Map Server Support

- Arc IMS
- Open GIS

Supported base file and compression formats

#### Base file formats

- Hatanaka (Compressed RINEX)
- RINEX
- DAT format
- SSF format

#### Compression types

- GZip (.gz)
- Self-extracting executable (.exe)
- Zip (.zip)

#### Data Export formats

- ARC/INFO (for NT and UNIX) Generate
- AutoCAD 2000 ASCII DXF (with or without blocks)
- D BASE
- Esri Shape files
- GRASS
- IDRISI Vector
- Google Earth KML and KMZ
- MapInfo MIF
- MGAL
- Microsoft Access MDB
- Micro station version 7 DGN
- PC-ARC/INFO Generate
- PC-MOSS

#### **Weatherproof Housing Boxes**

These boxes should exhibit being a perfect enclosure to house the Receiver and its accessories and other electronic equipment that may be stored therein.

The box will be fitted with a fire retardant timber backboard to mount the equipment on. A clear door will be ideal but not mandatory. The boxes will be suitable for use in-door and outdoor with a weatherproof rating of IP65 or above. The dimensions should be 400mm\*600mm\*230mm.

#### **Gateway with integrated 3G Modem**

##### Supported Standards

- HSPA + (High Speed Packet Access Plus) 2100/900, 2100/850, 1900/850 MHZ
- HSUPA (High Speed Uplink Packet Access)
- HSDPA (High Speed Downlink Packet Access)
- WCDMA (Wideband Code Division Multiple Access) 2100/900, 2100/850, 1900/850 MHZ
- GSM (Global System for Mobile Communications)



<p>850/900/1800/1900 Mhz</p> <ul style="list-style-type: none"> <li>• GPRS (General Packet Radio Service (System) 850/900/1800/1900 Mhz</li> <li>• EDGE (Enhanced Data Rates for Global Evolution) 850/900/1800/1900 MHz</li> </ul> <p><b><u>3G ROUTER FEATURES</u></b></p> <p>Multiple network environments. Supports:</p> <ul style="list-style-type: none"> <li>• HSUPA/HSDPA/WCDMA/GSM/GPRS/EDGE</li> <li>• WPS</li> <li>• 4x RJ45 Lan ports</li> <li>• External 3g antenna interface (SMA Connector)</li> <li>• 802.11b/g/n</li> <li>• 180x123x32.5 mm</li> <li>• 1x RJ11 port</li> <li>• Built-in DHCP Server, DNS RELAY and NAT</li> <li>• Convenient web-based management</li> <li>• Windows 2000/Windows XP / Windows Vista / Windows 7</li> <li>• User Status LED indicators.</li> <li>• Receiving diversity and load equalizer</li> <li>• Built-in WCDMA / GSM WLAN high gain antenna</li> <li>• Suitable for: HSPA + / HSUPA / HSDPA / WCDMA / GSM / GPRS / EDGE</li> <li>• Provides immediate protection from potential security threats and block intrusion attempts.</li> <li>• High speeds. Supports data services from a maximum speed of HSPA + (28Mbit DL / s; UL5.76Mbit / s), HSPA (DL 7.2Mbit / s; UL5.76Mbit / s), 384kbit / s WCDMA, 236.8kbit / s EDGE, and 85.6kbit / s GPRS</li> </ul>	
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**CONFIGURATION GPS**

<b><u>SPECIFICATION</u></b>	<b><u>PROVIDED</u></b>
<p><b><u>SYSTEM</u></b></p> <ul style="list-style-type: none"> <li>• Windows Mobile® version 6.0 software</li> <li>• 806 MHz XScale processor</li> <li>• 128 MB DDR SDRAM</li> <li>• 1 GB non-volatile Flash storage1</li> <li>• Secure Digital (SDIO) memory card slot</li> <li>• CompactFlash (CF) (Type II) slot2</li> </ul>	





<ul style="list-style-type: none"> <li>• Integrated Bluetooth® 2.0</li> <li>• USB Boot with USB-host, and audio jack</li> <li>• VGA display (480 x 640), sunlight-readable color touchscreen</li> <li>• Integrated speaker and microphone</li> <li>• Notification LEDs</li> <li>• 15 hour battery life with active use (default settings)</li> <li>• Numeric style keypad</li> <li>• Audio jack</li> <li>• 12-month limited warranty</li> </ul>	
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<p><u>Standard Software</u></p> <ul style="list-style-type: none"> <li>• GPS Controller for controlling NMEA output and in-field mission planning</li> <li>• Microsoft® Office Mobile</li> <li>• Transcriber (handwriting recognition)</li> </ul> <p><u>Standard Accessories</u></p> <ul style="list-style-type: none"> <li>• Rechargeable Li-Ion battery module</li> <li>• Rugged stylus with spring-loaded tip</li> <li>• Stylus lanyard</li> <li>• AC Power supply with International adapter kit</li> <li>• USB data cable</li> <li>• User guide</li> <li>• Hand strap</li> <li>• Screen protectors (2-pack)</li> <li>• Getting Started CD with ActiveSync®</li> </ul> <p><u>CONFIGURATION OPTIONS</u></p> <ul style="list-style-type: none"> <li>• Integrated 802.11 b/g wireless LAN for local network connectivity</li> <li>• Integrated GPS (2–5 m post processed accuracy)<sup>3</sup></li> <li>• Integrated 1D laser barcode scanner</li> <li>• Integrated digital camera (color, 2-megapixel resolution)</li> <li>• PDA or numeric style keypad</li> </ul> <p><u>OPTIONAL FEATURES</u></p> <p><u>Software</u></p> <ul style="list-style-type: none"> <li>• Field software</li> <li>• GPS Office software</li> </ul>	
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<p><u>TECHNICAL SPECIFICATIONS</u></p> <p><u>Physical</u></p> <ul style="list-style-type: none"> <li>• Size. . . . . 17.6 cm x 10.0 cm x 5.0 cm (6.92 in x 3.92 in x 1.96 in)</li> <li>• Weight . . . . . 558 g (1.23 lb) including rechargeable battery</li> <li>• Processor. . . . . 806 MHz XScale processor</li> </ul>	
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- Memory ..... 128 MB RAM and 1 GB1 Internal Flash Disk
- Battery ..... Field swappable 5200 mAh Li-Ion rechargeable battery

Environmental

- Operating temperature ..... -30 °C to +60 °C (-22 °F to +140 °F)
- Storage temperature. .... -40 °C to +70 °C (-40 °F to +158 °F)
- Sand and dust ..... Proof
- Drop. .... 26 drops from 4 ft (1.22 m) onto plywood over concrete
- 6 additional drops at -30 °C (-22 °F)
- 6 additional drops at +60 °C (+140 °F)

Input/output

- 5 mega pixel camera
- Display ..... 480 x 640 pixel (VGA) 16 bit color TFT with LED backlight
- Interface. .... Touch screen, backlit hardware control keys
- Audio system events, warnings, and notifications
- Soft Input Panel (SIP) virtual keyboard and handwriting recognition software, power status LED
- Audio ..... Mono speaker, unidirectional microphone speaker

Record and playback utilities

- I/O. .... USB host and client, power, audio jack
- Radios. .... Bluetooth 2.04 + EDR, 802.11 b/g wireless LAN WPA2

GPS

- Channels. .... 48
- Update rate. .... 1 Hz
- Cold start time: 35 sec average
- Hot start time: 1 sec average
- Reacquisition: 0.1 sec average
- Time to first fix ..... 50 seconds (typical)
- Protocols. .... SiRF, NMEA-0183
- NMEA output at 9600 bps

Accuracy (HRMS) after differential correction<sup>5</sup>

- Code Post processed. .... 2-5 m

## CONFIGURATION LAP TOP

<u>SPECIFICATION</u>	<u>PROVIDED</u>
<p><u>Processor</u></p> <ul style="list-style-type: none"><li>• Core™ i7-4600U (Up to 3.00 GHz, 3MB L3, 1600 MHz FSB)</li><li>• Core™ i5-4300U (Up to 3.00 GHz, 3MB L3, 1600 MHz FSB)</li><li>• Core™ i5-4200U (Up to 2.60 GHz, 3MB L3, 1600 MHz FSB)</li><li>• Core™ i3-4010U (Up to 1.70 GHz, 3MB L3, 1600 MHz FSB)</li></ul> <p><u>Operating System</u></p> <ul style="list-style-type: none"><li>• Windows 7 Professional 64</li></ul> <p><u>Display</u></p> <ul style="list-style-type: none"><li>• 12.5" HD (1366 x 768)</li><li>• 12.5" HD IPS (1366 x 768)</li><li>• 12.5" FHD IPS (1920 x 1080) with Multi touch</li></ul> <p><u>Graphics</u></p> <ul style="list-style-type: none"><li>• HD4400 Graphics</li><li>• Webcam</li><li>• Face-tracking technology, low light sensitive</li><li>• Memory</li><li>• Up to 8GB DIMM</li></ul> <p><u>Battery</u></p> <ul style="list-style-type: none"><li>• 3-Cell Internal (23.2 Wh)</li><li>• 3-Cell External (23.2 Wh)</li><li>• 6-Cell External Cylindrical (72 Wh)</li></ul> <p><u>Dimensions</u> (W x D x H) 12.02" x 8.19" x 0.79"</p> <p><u>Weight</u> &lt;3 lbs</p>	



Battery Life

- Up to 17.4 hours

Keyboard

- Precision Backlit Keyboard

I/O (Input / Output) Ports

- Mini Display Port with audio
- VGA
- 3.5 mm Combo Jack Headphone / MIC
- 2x USB 3.0, USB 2.0 (Always-on USB 2.0)
- 4-in-1 SD card reader (SD / SDHC / SDXC / MMC slot)
- Express card 34 mm
- Smart card reader

Storage

- HDD: 500GB / 1TB (5400 rpm)
- HDD: 500GB (7200 rpm)
- SSD: 128GB / 256GB SSD SATA3
- mSATA: 16GB

WIFI

- Centrino® 7260 2 x 2 BGN + BT 4.0
- Centrino® 7260 2 x 2 AC+ BT 4.0

Ethernet

- Yes

Bluetooth®

- yes

Navigation

- TrackPoint® with trackpad

Software

Preloaded Applications

Preloaded Applications

- ® Companion
- ® Support
- ® Cloud Storage
- ® Settings
- ® AppUp
- AccuWeather
- Amazon Kindle
- Evernote®
- Security
- Rara-Music



**STATION WORK STATION**

<b><u>SPECIFICATION</u></b>	<b><u>PROVIDED</u></b>
<p><b><u>STATION WORK STATION</u></b></p> <p><u>Operating Systems</u></p> <p><u>Preloaded</u></p> <ul style="list-style-type: none"> <li>• Genuine Windows 7® Professional 64-bit</li> </ul> <p><u>Supported</u></p> <ul style="list-style-type: none"> <li>• Genuine Windows XP Professional 64-bit</li> <li>• Genuine Windows XP Professional 32-bit</li> <li>• Red Hat Enterprise Linux 6.2</li> </ul>	
<p><b><u>Motherboard Summary</u></b></p> <p><u>Form Factor</u></p> <p>Board Size .....12.3" x 9.9" (311.66mm x 251.84mm)</p> <p>Layout..... Custom ATX</p> <p><u>Motherboard Core</u></p> <p>Processor Support      Quad Core (Sandy Bridge EP)                                       Six Core (Sandy Bridge EP)                                       Eight Core (Sandy Bridge EP)</p> <p>Socket Type .....(1) x Socket-R (LGA2011)</p> <p>Memory Support .....1600/1333/1066/800 MHz</p> <p>QPI (GTPS) .....6.4/7.2/8.0 GTPS Links</p> <p>Voltage Regulator .....VR 12.1 – 130W TDP</p> <p>Chipset (PCH)          Patsburg A                                       Support for SAS HDD enablement module                                       HW module to allow enablement of –B</p> <p>SKU</p> <p>Flash .....128Mbit SPI Flash with FWH</p> <p>Super I/O..... Nuvoton 6681D</p> <p>Clock..... ICS932SQ420B</p> <p>Audio .....Realtek ALC662-VD</p> <p>Ethernet..... Lewisville – 82579</p> <p>SAS..... Integrated with Patsburg –A + SAS HDD enablement module</p> <p><u>Memory</u></p> <p>Slots..... 8</p>	



Channels..... 4  
 Type..... DDR3 Unbuffered SDRAM (UDIMM, RDIMM, LRDIMM)  
 ECC Support .....Yes  
 Speed.....Up to PC3-12800 (1600MHz)  
 Max DIMM Size .....up to 8GB UDIMM, up to 32GB RDIMM  
 Max System Memory .....Up to 64GB UDIMM (w/8GB), Up to 256GB RDIMM (w/32GB)

Ethernet

Count..... 1  
 Speeds .....10/100/1000 Mbps  
 Functions .....PXE  
 WOL  
 AMT  
 Jumbo Frames

Connectors..... (1) x RJ45 on Rear I/O

Audio

Type .....HD (5.1)  
 Internal Speaker ..... Yes  
 Connectors..... (3) x Rear 3.5mm Jacks (Line In, Line Out,  
 Microphone In)  
 (2) x Front 3.5mm Jacks (Headphone out, Microphone In)  
 (1) x 2-Pin Internal Speaker Header

Video

Adapter .....(2) x PCI-E 3.0 16-Lane Slots  
 Additional adapters may be supported in x4 slots for Spec Bids.

Multi-GPU..... Support BIOS supported, card dependant

Storage

SATA/SAS..... (2) x SATA Connectors, Gen. 2 (AHCI)(2) x SATA Connectors, Gen. 3(AHCI)  
 (3) x SATA/SAS Connectors, Gen. 2 (SCU)  
 SAS drives on SCU require SAS HDD enablement module to function  
 (1) x eSATA Connector, Gen. 2 (eSATA bracket)

- SATA RAID 0,1,5 supported natively via Controller
- SAS RAID 0,1 and SATA RAID 0,1 supported via SAS HDD enablement module
- SAS and SATA RAID 0,1,5 supported via

- LSI 9260-8i adapter
  - SAS and SATA RAID 0,1 supported via LSI 9240-8i adapter
  - SAS and SATA RAID 0,1,5 supported via LSI 9240-8i with key
- eSATA (1) x eSATA Connector, Gen. 2, cabled to slot via bracket

Slots

- Slot 1 (Near CPU) 16-Lane PCI-E v3.0 – Full Length, Full Height
- Slot 2 4-Lane PCI-E v3.0 (16-Lane Mechanical) – Full Length, Full Height
- Slot 3 16-Lane PCI-E v3.0 – Full Length, Full Height
- Slot 4 PCI v2.3 – Full Length, Full Height
- Slot 5 (Near Edge) 4-Lane PCI-E v2.0 Half Length, Full Height

Rear I/O

COM (1) x Serial Port (COM1)  
 eSATA (1) x eSATA Port (Gen. 2), optional via

bracket

Audio .....Microphone-In, Line In, Line Out

Ethernet..... (1) x RJ45

USB 2.0..... (8) x USB 2.0 Ports

USB 3.0..... (2) x USB 3.0 Ports

Internal I/O

- USB 2.0
- Front Panel USB Header (2 ports)
  - Media Card Reader Header
  - Internal USB connector

PS/2 .....(1) x 2-port PS/2 Header, ports optional via bracket

Audio.....(1) x Front Panel Mic & Line-Out Header

Clear CMOS .....3-Pin Clear CMOS Header

Speaker .....2-Pin Internal Speaker Header

Chassis Intrusion..... 2-Pin Chassis Intrusion Switch Header

Thermal

Fans Headers

- x 4-Wire CPU Fan
- x 4-Wire Rear Fan
- x 3-Wire Front PCI Fan
- x 4-Wire Front HDD Fan
- x 5-Wire Memory Fan
- x 3-Wire PCH Fan (PCH Fan not installed)

Power Connectors

Main..... (1) 24-Pin (2x12) ATX Standard

VRM..... (1) 8-Pin (2x4) ATX 12V Standard

Graphics..... (1) 4-Pin (2x2) ATX 12V Standard

Ethernet

motherboard implements onboard gigabit Ethernet via one Intel controller. This integrated solution has support for the industry standard functions of Wake on LAN (WOL) and Preboot Execution Environment (PXE). Jumbo Frames are supported.

Windows7 Premium performance requirements. HD 5.1 audio is supported via jack Remapping. There are 2 front analog jacks, and 3 rear color-coded (per

Clock Generator

The clock generator chip .....ICS932SQ420B.

Chassis Summary

Chassis .....31-liter ATX-form factor tower mechanical with 2 external 5.25" drive bays,1 external 3.5" drive bay, and 3 internal 3.5 drive bays.

Chassis Info:

Chassis Format.....Tower  
Chassis Dimension – cm: 483mm D x 175mm W x 478mm H  
Chassis Dimension – in: 19.02" D x 6.89" W x 18.82" H  
Chassis Weight: 38.5 lbs (17.5kg) maximum configuration  
Power supply: 610W 90% Efficient

**GENERAL SPECIFICATION**

Type..... Workstation  
Product Form Factor..... Tower  
Built-in Devices .....Speaker  
Security Trusted Platform Module (TPM)..... Security Chip  
Color .....Raven black  
Localization..... English

**Processor / Chipset**

Type..... Intel Xeon E5-1650 / 3.2 GHz  
Max Turbo Speed ..... 3.8 GHz  
Number of Cores..... 6-core  
Computing bit.....64  
CPU Upgradability..... Upgradable

Processor Main Features

- Intel Turbo Boost Technology 2,
- Enhanced Intel Speed Step Technology,
- Hyper-Threading Technology,
- Intel Virtualization Technology,
- Intel Execute Disable Bit

CPU Socket..... LGA2011 Socket

Chipset Type..... Intel C602

Cache Memory

- Installed Size..... L3 cache - 10 MB
- Cache Per Processor..... 10 MB



RAM

- Installed Size 4 GB / 64 GB (max)
- Technology DDR3 SDRAM - ECC
- Memory Speed 1600 MHz
- Memory Specification Compliance PC3-10600

Form Factor .....DIMM 240-pin  
Features .....Unbuffered  
Configuration Features .....1 x 4 GB

RAM Supported

- 128 GB - Registered - ECC,
- 64 GB - Unbuffered - ECC

Hard Drive

Type..... HDD  
Capacity .....1 x 500 GB  
Interface Type..... Serial ATA-300 Serial ATA  
Spindle Speed..... 7200 rpm

Storage Controller

Type..... 1 x RAID – Integrated  
Controller Interface Type .....Serial ATA-300

RAID Level

- RAID 1,
- RAID 5,
- RAID 0

Optical Storage.....Type DVD-Writer - Serial ATA

Card Reader.....Type 25 in 1 card reader

Graphics Controller

Type..... Plug-in card  
Graphics Processor ..... NVIDIA Quadro 4000  
Video Memory..... 2 GB  
Video Interfaces..... Display Port,  
DVI  
Max Monitors Supported..... 2

Input Device

- Mouse,
- Keyboard

Audio Output

Type Integrated  
Speaker(s) None

Keyboard

Keyboard Name..... Preferred Pro USB



## Interface USB

### Mouse

- Technology Optical
- Interface USB
- Features Scroll

### Networking

- Type Integrated
- Data Link Protocol Fast Ethernet,
- Ethernet,
- Gigabit Ethernet

### Miscellaneous

- Features Carrying handles
- Compliant Standards GREENGUARD
- Manufacturer Selling Program Top Seller

### Expansion / Connectivity

#### Bays

- 2 (total) / 1 (free) x External 5.25" x 1/2H,
- 3 (total) / 2 (free) x Internal 3.5" x 1/3H,
- 1 (total) / 0 (free) x External 3.5" x 1/3H

#### Slots

- 8 (total) / 7 (free) x DIMM 240-pin,
- 1 (total) / 0 (free) x CPU,
- 2 (total) / 1 (free) x PCIe 3.0 x16,
- 1 (total) / 1 (free) x PCIe 2.0 x16 ( x4 mode ),
- 1 (total) / 1 (free) x PCIe 2.0 x4,
- 1 (total) / 1 (free) x PCI

#### Interfaces

- 10 x USB 2.0 ( 2 front, 8 rear ),
- 2 x Microphone ( 1 in front ),
- 1 x Headphones ( 1 in front ),
- 1 x Serial,
- 1 x DVI-I (dual link),
- 1 x LAN (Gigabit Ethernet),
- 1 x Audio line-in,
- 1 x Audio line-out,
- 2 x DisplayPort,
- 2 x USB 3.0 ( 2 in front )

#### Power

- Device Type Power supply
- Power AC 120/230 V ( 50/60 Hz )
- Power Provided 610 Watt

Operating System / Software

- OS Provided Microsoft Windows 7 Professional 64-bit Edition
- Microsoft Office Preloaded Includes a pre-loaded image of select Microsoft Office 2010 suites. Purchase an Office 2010 Product Key Card or disc to activate preloaded software on this PC.

Environmental Standards

- ENERGY STAR Qualified

Environmental Parameters

- Min Operating Temperature 50 °F
- Max Operating Temperature 95 °F
- Humidity Range Operating 10 - 80% (non-condensing)

Dimensions & Weight

- Width 6.9 in
- Depth 19 in
- Height 18.8 in
- Weight 38.6 lbs

Manufacturer Warranty

- Service & Support 3 years warranty



## CENTRAL SERVER COMPUTER

<u>SPECIFICATIONS</u>	<u>PROVIDED</u>
<u>CHIPSET</u> C226 Chipset TPM 1.2 Encryption	
<u>PROCESSOR</u> E3-1200 v3 processor choices Core™ i3, Pentium and Celeron processor choices	
<u>MEMORY</u> 4 x 1600 MHz ECC UDIMM (32GB max)	
<u>PCI-E EXPANSION.</u> Slot 1: x16 Gen3 PCIE Slot 2: x1 Gen2 PCIE Slot 3: x16 Gen2 PCIE (x4 signal) Slot 4: PCI	
<u>STORAGE CONTROLLER</u> Onboard 6GB SATA RAID 0/1/10/5 with RSTe™ Server RAID 500 II Adapter (6GB SAS/ SATA HW RAID 0/1/10) with RAID 5 Upgrade Key Server RAID 700 II Adapter (6GB SAS/ SATA HW RAID 0/1/5/10/50) with Battery Backup	
<u>MANAGEMENT</u> Advanced Management Technology 9.0 with remote KVM* Standard Manageability tools Key features: remote power on / off, Asset tag and HW inventory, IDE-R, SOL, Remote restart, Event alerting/logging, IP-based	
<u>STORAGE</u>	





Configuration choices:

4 x 3.5" non-hot swap drives

8 x 3.5" hot swap drives

8 x 2.5" hot swap drives

Hard drive choices:

3.5" SATA 7.2K 6GB enterprise drive choices:  
500GB/1TB/2TB/3TB/4TB

2.5" SAS 10K 6GB enterprise drive choices:  
300GB/450GB/600GB/900GB

2.5" SAS 15K enterprise drive 6GB choices: 300GB

2.5" SATA 7.2K 6GB enterprise drive choices: 500GB

**I/O EXPANSION**

One PCIe x8 Gen2 HH/FL (x16 mech)

One PCIe x8 Gen2 HH/HL (x8 mech)

One PCIe x4 Gen2 HH/HL (x8 mech)

One 5V 32-bit/33 MHz PCI

Optional Parallel port via PCI card

Optional Modem via PCI card

USB 3.0 ports (blue) – 4 rear, 2 front

USB 2.0 ports – 2 rear

Serial port – rear

Video port – rear

**SOFTWARE**

(Standard, Foundation, Essentials) Windows Server 2012

(Standard / Enterprise / Datacenter)

Windows Server 2008 – x86 Edition

Windows Server 2008 – x64 Edition

Windows Server 2008 R2 – x64 Edition

Windows Server 2008 R2 SP1 – x64 Edition

(Standard / Enterprise)

Windows Server 2003 – x86 Edition

(Standard / Premium Add On)

Windows Small Business Server 2011

VMWare vSphere 5

RedHat Enterprise Linux Server (5.7 / 6.1)

Novell SUSE Linux Enterprise Server

(11.1 / 11.2)4

**Ethernet**

Integrated Gigabit Ethernet port

(shared with AMT)

Optional Dual Port 1GbE NIC (I350-T2)

Optional Quad Port 1GbE NIC (I350-T4)

**Power**

Fixed Power Supply – 405 W (92% efficiency)

Optional Redundant Power supply – 450 W (92% efficiency)

ENERGY STAR Server 1.1 compliant

**Dimensions**

PACKAGING : 5U / 50L Tower

DIMENSIONS : 195mm x 430mm x 595mm

(7.67" x 16.92" x 23.42")

WEIGHT : 25 kg (55.1 lbs) (maximum)