On June 22, 2010, Motion Computing introduced the Motion J3500, a successor to the J3400 Tablet PC. Motion launched early 2009. The new tablet contains a good number of technology enhancements that clearly place the J3500 at the very forefront of full Windows power tablet technology. Thanks to a switch to Intel’s latest ultra low voltage 2010 Core i5/i7 processors, the J3500 offers substantial performance improvements while remaining as, or more, power-efficient. Perhaps even more importantly, the availability of capacitive dual touch technology offers the potential shown by Apple’s iPhone and iPad without giving up on the very precise electromagnetic digitizer technology often required in Motion’s target markets. Add enhanced toughness via optional Gorilla glass and more flexible mobile broadband and GPS functionality via integrated Gobi2000, and Motion’s claim of the J3500 being the “most advanced and feature-rich” tablet on the market seems entirely justified.

The Motion J3500: What’s new?

What’s new with the Motion Computing J3500 tablet compared to the predecessor J3400?

- Intel Core i5 or i7 technology with ultra-low voltage 1.06GHz Core i5 520UM or 1.2GHz Core i7 640UM processors provides significantly higher performance than the predecessor model.
- You can now get projected capacity multi touch in conjunction with the standard digitizer. Yes, that meansswiping, dragging, two-finger pinching and rotating.
- It’s the first major update to the Motion J3400 which was a brand-new design in early 2009.
- The machine now runs Windows 7 Professional (there is a Windows XP downgrade option).
- You can now get Gorilla glass that offers very high break resistance (albeit not available with the capacitive screen).
- You can get more storage (up to 160GB hard disk, up to 128GB SSD, up to 4GB RAM).
- Integrated auto-focus 3-megapixel documentation camera (up from 2mp) can take time/date and GPS-stamped documentation pictures.
- Integrated Gobi 2000 is available (includes GPS), supporting all major RF bands around the world in one chipset (see Gobi 2000 product sheet).
- The J3500 has IP52 sealing and can handle 3-foot drops.
- Pricing starts at US$2,299, with our maxed-out configuration at US$3,162.

Tablets — The big picture

While the new Motion J3500 may well be the best overall Windows-based tablet ever, the tablet market itself is at a crossroads. First introduced in the early 1990s with products such as the initial IBM ThinkPad and tablets from Toshiba, Fujitsu and many others, Tablet PCs didn’t get a more or less unified platform until 2002 when Microsoft issued some tablet hardware guidelines and introduced the Tablet PC Edition of Windows XP. That’s when Motion Computing introduced their initial tablet, and the company has been pursuing the tablet market with a combination of good business sense, laser-sharp focus on what matters in tablets, and great products that almost always offer the latest technology before anyone else.

Unfortunately, while Motion was quite successful with its tablets and focus on vertical markets, the Tablet PC as a category didn’t fare quite as well. Hammered by only a half-hearted commitment to the tablet form factor (Microsoft itself redirected emphasis from tablets to notebook convertibles before the Tablet PC Edition was even released), high costs and the marginal suitability of Windows as a tablet OS relegated the Tablet PC to the sidelines. All of this has changed this year with the release of the Apple iPad, which sold over two million in its first few months, and triggered a tablet gold rush to market with dozens of iPad copies.

However, this time Microsoft may not be in the picture. Even with Windows 7’s enhanced support of touch and inclusion of multi touch, full Windows simply isn’t a tablet OS, at least not if what’s desired is largely consumer-oriented iPad functionality. As is, future tablets may run the WebOS Hewlett Packard bagged with its acquisition of Palm, or Android, the eminently scalable smartphone OS currently doing battle with Apple’s iOS. Analysts predict tablet sales in the tens of millions, and this time they just may be right with their crystal balls.

So these are the times Motion Computing faces at the introduction of its new flagship tablet. Unlike all the iPad wannabes out there, Motion’s new machine is neither a concept nor an attempt at hedging the bets, nor a trial balloon to test the tablet market waters. Instead, it’s the latest and technologically most sophisticated and advanced product from a company that knows the tablet market better than anyone. As such, however, Motion’s latest is not an industrial or more powerful version of the iPad, but remains a true blue Tablet PC, with the latest from Intel and the latest from Microsoft. Additionally armed with the latest display technology and the latest digitizer technology, this Motion machine is probably the culmination of the current Windows tablet paradigm.

That means the newest ultra low voltage Core processors from Intel, the fastest memory, the largest solid state disks, the incomparable Hydis AFFS+ display technology, and now even digitizer technology that effortlessly melds the fashionable multi touch with the tried-and-true Wacom digitizer. All of this comes in a handy 12.7 x 9.1 inch tablet that’s not even an inch thick and weighs just four pounds flat, dual batteries included. There’s a big wide-format 12.1-
inch screen and all the power of Windows 7 Professional. If that's what you need in a tablet, that's what you get with the J3500, and it currently doesn't get any better than this.

**Intel Core i7 performance**
When Motion Computing recently updated its C5/F5 tablets from an ultra low voltage Core 2 Duo processor (the U7750) to the Core i7 640UM, we found a roughly 2.2x overall performance increase. That's a dramatic difference that is immediately noticeable, and certainly an excellent argument both to select the F5v as well as upgrading from the earlier versions. The Motion J3400, however, already had an Intel processor exceptionally well suited for duty in a tablet in the 1.4GHz Core 2 Duo SU9400. In our initial review of the original J3400, we stated that this kind of performance puts the Motion J3400 at the very forefront of mobile computing technology, and certainly so among low-power, ultra-mobile designs. Can the J3500 top that? Motion thinks so and says it found a nearly 40% performance improvement in its own internal tests.

Looking at the specs, however, would lead one to believe that whatever power gains were made would come at a severe cost in battery life. That's because while the SU9400 processor had a thermal design power rating of 10 watts, both new processors used in the J3500 have a TDP of 18 watts, even though they are considered ultra low voltage. Thermal Design power is defined as the maximum amount of power the cooling system in a computer is required to dissipate, and it's often used as an approximate indicator for performance.

To find out, we ran Passmark Software's PerformanceTest 6.1 that runs about 30 tests covering CPU, 2D graphics, 3D graphics, memory, and disk and then computes scores for each category and an overall PassMark score. For comparison, we're listing the predecessor Motion J3400 and also both the original and the latest version of Motion's F5 semi-rugged tablet computer. This shows not only how the J3500 compares to the F5v, but also by how much the latest versions improved over their respective predecessors.

As we expected based on our experience with these processors, the new J3500 is indeed quite a bit quicker than the J3400. In the overall PassMark benchmark we saw an improvement of about 24%, whereas the overall CrystalMark index is 67% higher. This means that RuggedPCReview.com’s performance benchmark testing confirms Motion’s assertion of a nearly 40% performance improvement. The improvement between the J3400 and J3500 is not as drastic as that between the original Motion F5 and the latest F5v, but that’s to be expected given the J3400’s more recent and modern underpinnings.

Note that benchmark results are never without surprises. For example, the two benchmarks do not agree on sheer computation power where CrystalMark greatly favors the new Core i7 chip whereas Passmark actually has the older SU9400 chip ahead. The situation is quite clear in the memory benchmarks where the newer design has a definite advantage. Somewhat unexpected was the much improved disk benchmark as both the older and the new test units had SSDs. On the graphics side there is substantial improvement as well, probably thanks to the memory controller and integrated graphics with HD hardware acceleration. Graphics performance still does not come close to that provided by discrete graphics sub systems, but it is definitely faster than before.

We also ran the “Windows Experience Index” that Microsoft includes in Windows 7 as an indicator of a computer's performance and got the following scores (for comparison we also included the scores of an older Motion LE1700):

**WINDOWS EXPERIENCE INDEX**

<table>
<thead>
<tr>
<th>Model</th>
<th>J3500</th>
<th>J3400</th>
<th>LE1700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>5.7</td>
<td>4.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Memory (RAM)</td>
<td>5.5</td>
<td>4.9</td>
<td>4.2</td>
</tr>
<tr>
<td>Graphics</td>
<td>3.5</td>
<td>3.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Gaming Graphics</td>
<td>3.6</td>
<td>3.3</td>
<td>3.1</td>
</tr>
<tr>
<td>Primary hard disk</td>
<td>6.9</td>
<td>5.9</td>
<td>5.3</td>
</tr>
</tbody>
</table>

**Battery power: a frugal machine**
Battery life is another area where competition is getting more ever-intense. Two or three hours used to be considered quite good. The J3400/J3500’s predecessor, the LE1700, was expected to get about three hours between charges. However, between advancing battery technology, more efficient processors, and better power management, three hours was no longer good enough and many mobile systems now sport battery lives of six to eight hours and more. As a result, Motion, too, sought to increase battery life in its new machine.

**PERFORMANCE**

<table>
<thead>
<tr>
<th>PERFORMANCE</th>
<th>Motion J3500</th>
<th>Motion J3400</th>
<th>Motion F5v</th>
<th>Motion F5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Core i7-640UM</td>
<td>Core 2 Duo SU9400</td>
<td>Core i7-640UM</td>
<td>Core Solo U1400</td>
</tr>
<tr>
<td>Clock speed</td>
<td>1.2 GHz</td>
<td>1.4 GHz</td>
<td>1.2 GHz</td>
<td>1.2 GHz</td>
</tr>
<tr>
<td>Thermal Design Power</td>
<td>18 watts</td>
<td>10 watts</td>
<td>18 watts</td>
<td>5.5 watts</td>
</tr>
<tr>
<td>CPU Mark</td>
<td>659.2</td>
<td>834.9</td>
<td>781.4</td>
<td>324.9</td>
</tr>
<tr>
<td>2D Graphics Mark</td>
<td>181.5</td>
<td>172.9</td>
<td>184.6</td>
<td>153.8</td>
</tr>
<tr>
<td>Memory Mark</td>
<td>502.5</td>
<td>347.1</td>
<td>496.1</td>
<td>235.1</td>
</tr>
<tr>
<td>Disk Mark</td>
<td>1004.6</td>
<td>552.5</td>
<td>1040.2</td>
<td>168.8</td>
</tr>
<tr>
<td>3D Graphics Mark</td>
<td>276.1</td>
<td>105.3</td>
<td>256.3</td>
<td>75.6</td>
</tr>
<tr>
<td>Overall PassMark</td>
<td>538.6</td>
<td>435.2</td>
<td>564.9</td>
<td>194.4</td>
</tr>
<tr>
<td>ALU</td>
<td>23,294</td>
<td>13,632</td>
<td>23,147</td>
<td>4,565</td>
</tr>
<tr>
<td>FPU</td>
<td>21,721</td>
<td>12,991</td>
<td>23,596</td>
<td>5,343</td>
</tr>
<tr>
<td>MEM</td>
<td>17,025</td>
<td>9,299</td>
<td>16,552</td>
<td>4,989</td>
</tr>
<tr>
<td>HDD</td>
<td>28,029</td>
<td>16,418</td>
<td>24,780</td>
<td>3,252</td>
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<tr>
<td>GDI</td>
<td>6,862</td>
<td>4,847</td>
<td>6,978</td>
<td>4,239</td>
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<tr>
<td>D2D</td>
<td>1,416</td>
<td>1,003</td>
<td>1,492</td>
<td>4,221</td>
</tr>
<tr>
<td>OGL</td>
<td>1,694</td>
<td>1,061</td>
<td>1,617</td>
<td>1,151</td>
</tr>
<tr>
<td>Overall CrystalMark</td>
<td>100,041</td>
<td>59,881</td>
<td>98,162</td>
<td>27,760</td>
</tr>
</tbody>
</table>

The total battery capacity of the J3500 remains unchanged: That’s provided via dual hot-swappable 14.8V/2.00Ah Li-Ion batteries fitting into the bottom of the machine where they become part of the design. The batteries have an external push button that instantly shows, via 5 LEDs, how much charge is left. One word about the hot-swappable aspect. In the J3500 it means you can take out one battery and replace it with a fresh one; you cannot take out both at once. And if you only use one battery, it is not hot-swappable. We’d have liked to see a true hot-swap feature as in the new Motion F5v where an internal backup battery gives you about a minute to replace the spent battery with a freshly charged one.

As was the case with the predecessor J3400, our BatteryMon power drawstest was unable to measure battery draw. The program, however, did compute estimated battery life based on remaining charge compared to full charge and we saw as much as seven hours. This was with WiFi on and the system idling along. During a typical day, power savings modes will make the system go to sleep and wake up again when the computer is being used, and that works much better in Windows 7 than in Vista or XP. While in sleep mode, the power consumption is...
extremely low, and greatly extend battery life. This makes an exact estimate of real life battery life more difficult as a typical machine will not be used continuously.

We also connected the J3500 to a Kill-a-Watt electricity usage monitor with both batteries removed and, with the J3500 set to power conservation mode, we saw a minimum draw of about 11 watts. That’s two watts lower than what we observed on the J3400. And it’s about the same as the 10.9 watts we observed via BatteryMon on our review Motion F5v, which makes sense. Given the 60 watt-hour capacity, the 11 watt draw would indicate about 5.5 hours of battery life.

Capacitive dual touch now available!
The Motion J3500 has capacitive dual touch! Ever since the iPhone, and now the iPad, capacitive multi touch has become the Holy Grail of touch interfaces, with everyone aiming to duplicate the effortlessly elegant implementation in Apple’s products. That is not easy, but capacitive touch on the J3500 definitely works much better than on any other Windows-based machine I’ve tried so far. How did Motion do it? A tap on the “About” button in the J3500’s Touch Settings control panel said “Touch Driver v3.2.1-1 Wacom Co., Ltd., 2007-2010.” So there. Wacom. Now Wacom’s been the undisputed leader in electromagnetic digitizers pretty much since the dawn of tablets and digitizers, but the company had struggled with capacitive digitizers, and especially something that would integrate with their electromagnetic digitizer. In 2007, Wacom bought Austin, Texas-based TouchKO, a company that had specialized in surface capacitive touchscreens, an interesting technology, but one that cannot do multi touch.

If you dig deeper into Wacom’s website, you also find a technology page on RRFC (Reversing Ramped Field Capacitive) touch technology. The technology was said to allow combination with Wacom’s EMR digitizer for a true dual-mode input solution. RRFC apparently uses four separate electrostatic fields (as opposed to the single field in standard surface capacitive designs). However, a check with Motion indicated that they did not use RRFC but Wacom’s “gen 6 P-Cap multi touch technology” instead. Now PCAP simply stands for projected capacity and there doesn’t seem to be any further information on the technology Wacom used here. In general, projected capacitive is a good step up from the simpler surface capacitive screens as projected technology uses an x-y grid that’s usually etched into the conductive layer.

So here’s the scoop on what capacitive touch on the J3500 can do and what it can’t (and the video to the right provides a demonstration). When you check the Touch Settings control panel, it says “Two Finger Touch Device” and that is what the technology appears to be set up to do. You can use either one finger or two, but not three or more. That is technically multi touch, and it’s what the iPhone and the iPad do. They also only acknowledge two fingers, and that’s how all the magic is done.

On the Motion J3500, you can, for example, draw two simultaneous lines in Microsoft’s simple Paint application. You can drag and whirl two images in Microsoft’s Collage demo program, and you can use two fingers in Microsoft Surface Globe. It all works remarkably well, and actually much better than in any other PC-based multi touch system we tested.

However, this is, of course, still Windows, and so there are applications where multi touch works and others where it doesn’t.

In the Windows Photo Viewer, for example, you can pinch and expand to zoom in and out, and you can also rotate pictures in 90 degree increments. However, in Google Earth, which would be a natural for multi touch, none of the two-finger gestures work and you have to resort to old-fashioned tapping on controls.

How do touch and pen work together? Very well. In essence, as soon as the tablet senses the pen, it stops responding to touch. When it no longer senses the presence of the pen, touch instantly returns. This way, you can operate the tablet in touch mode, and then simply use the pen for actions and software that require precise manipulation. The control panel also lets you set the system so that a double-tap toggles between pen only and touch only modes.

Fantastic display
The Motion J3500’s display uses the 16-to-10 “wide-format” aspect ratio that has largely replaced the old “standard” 4-to-3 aspect ratio displays (albeit not in the trend-setting iPad). The shift to wide displays may be due to computers following the trend set by television sets where a wide screen is better able to display movies that are almost always in wide format. The 12.1-inch display Motion chose is made by Hydis Technologies, which pioneered AFFS (Advanced Fringe Field Technology) displays that offer a full 180-degree viewing angle from all directions. The LCD in the J3500 uses AFFS+, an evolutionary advance to AFFS that lowers power consumption and increases outdoor readability. It has a resolution of 1280 x 800 pixel and uses an LED backlight. Brightness is 320 nits, but thanks to the AFFS+ technology you’d swear it was more than that. Since the display essentially uses transmissive technology with certain transfective features, the screen is bright and crisp indoors while being amazingly vibrant and readable outdoors.

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In everyday use, the J3500 display’s outdoor performance is excellent. The perfect viewing angle from all directions means you never have to tilt and angle the tablet to see what’s on the screen. The display itself excels in eliminating unwanted reflection or diffusion. Where other displays appear matte or milky or are overcome with reflections, the J3500’s stays perfectly readable. In head-on, direct sunlight the display is still readable, here thanks to the inner reflectance of the Hydis LCD.

How does it all work? Hydis claims that the reflective polarizer used in AFFS+ displays lowers surface reflectance and minimizes screen scattering. They claim a screen reflectance of under 0.3% (and here I assume the value supplied by Hydis means total reflectance of all surfaces). Given that the effective contrast ratio of an LCD used outdoors is computed as 1 + (emitted light / reflected light) and that average sunlight is about 10,000 nits, the J3500 screen has an effective contrast ratio of $1 + (320 / > .003 x 10,000) = 1 + > 10.66 = > 11.66$. On our scale that means “definitely readable in sunlight” and subjective viewing tests confirm that.

The J3500 display also seems to have fixed the predecessor J3400 display’s tendency to attract fingerprints and other smudges like a magnet. The new display seems almost immune to it.

While detailed specifications help in determining how easy it is to view and use a display outdoors, you won’t know how good it is until you take it outdoors in the sunlight. It also helps to have a point of reference, in this case other displays to compare to. We felt it would be interesting to see how the Motion J3500 compared to two types of displays common these days—an example of a high gloss screen that most current consumer and business notebooks have these days, and a sample of a “matte” display with anti-glare treatment. The comparison machines we chose are a Gateway notebook we use around the office and a Toshiba Portege M700 Tablet PC convertible, predecessor to the still available Portege M780, and beneficiary of almost two decades of Toshiba pen computing experience.

The 2006-vintage Gateway does not specifically have an outdoor screen but despite its glossy screen, a degree of anti-reflective treatment makes it useful enough to be taken along on trips.

The picture below shows the Gateway and the J3500 in the shade on a bright, sunny day, facing away from the sun. Both displays are bright and readable in this outdoor setting, and even though the Gateway screen is glossy, from this angle there are few reflections. The J3500’s somewhat brighter backlight is clearly noticeable.

The next picture shows the computers in bright daylight from an angle. Here, the Gateway’s glossy display becomes totally mirror-like and unreadable. In contrast, the J3500 screen has no problems at all.

Toshiba took a different approach and used a matte display with anti-glare coating. This works under many circumstances, but not in strong daylight where the anti-glare treatment simply diffuses the light, making the display milky and unreadable. The J3500’s AFFS+ display remains very readable.
Direct sunlight is always the toughest test because no amount of backlight is a match for the sun. Readability then relies on how well the LCD can reduce the amount of day/sunlight reflected from its various surfaces. The less daylight reflected, the higher the ratio between backlight and reflected daylight, and the more readable the display remains. Clearly, the J3500 does as good a job as can be done.

**Gorilla glass: 4x break resistance**

In October 2009, Motion began offering Corning’s somewhat funkily named “Gorilla glass” as an option with its C5 and F5 tablets, and it’s now available with the J3500 as well. What is Gorilla glass? According to Motion, it is “thin-sheet glass that was designed to protect against real-world events that cause display damage.”

Examine some of the video on Corning’s Gorilla Glass page, and you see the glass being bent and steel balls falling onto it. The glass neither shatters nor breaks. In fact, it’s hard to believe it’s glass at all. It looks more like a very thin sheet of some polycarbonate plastic or acrylic. But it is glass.

The secret, according to Corning’s Dr. Shashidhar with whom I had the pleasure of talking on the phone about Gorilla glass, lies in a special chemical ion-exchange strengthening process that results in the glass neither shatters nor breaks. In fact, it’s hard to believe it’s glass at all. It looks more like a very thin sheet of some polycarbonate plastic or acrylic. But it is glass.

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**Data input methods**

The Motion J3500 is very flexible when it comes to data entry. It can be used with any external USB keyboard or with its innovative keyboard/stand combo. There are times, however, when you carry the tablet around and there is no physical keyboard present. That’s when users rely on alternate data entry methods. Tablet computers usually offer various methods, and Motion made available a variety of onscreen data entry methods as well as customization options.

Windows 7 continues to offer the standard Microsoft input panel that can be used as an onscreen keyboard (see top screen in the picture below) or for free-form (or character-by-character) handwriting. The Microsoft keyboard can now be resized to any size, and is much better than in the past.

**Integrated documentation camera**

Many of the Motion J3500’s intended applications can benefit from comprehensive, integrated documentation, and the tablet therefore has a built-in camera that can snap pictures as large as 2048 x 1536 pixel. That’s 3-megapixel instead of the 2-megapixel of the J3400. The lens is embedded in the bottom of the unit, so it is clearly meant to record pictures, situations and movies as opposed to enabling video conferencing. Cameras integrated into computers don’t have the best reputation for sharpness or speed, and while the new 3-megapixel camera has pretty quick autofocus and a nice LED illuminator for shooting in low-light conditions, it remains lightyears behind even basic dedicated digital cameras. Why is that is beyond me. There are tiny CCD and CMOS assemblies with autofocus that can take hi-res pictures and glorious 1080p HD video, and why that is not available even in top-notch computer hardware such as the J3500 is odd.

The J3500 comes with an interesting (albeit difficult to figure out)”Picture Snapper” interface that is embedded in the QuickNav utility and has the ability to add time/date stamping and geotagging information to images. The picture to the right shows the Picture Snapper in a potential application: Assume that an inspector needs to document label data and safety stickers on compressor units. They could then use the J3500 to take a close-up of the systems and QuickNav would automatically add a date and time stamp as well as full GPS data. Talk about comprehensive documentation! The potential for this kind of information via integration of onboard functionality is tremendous.

**Interface and connectivity**

Unlike ultra-rugged slate computers that often have almost no onboard connectivity due to sealing requirements, Motion has always offered plenty of interface ports on its machines, and the J3500 is no
different. There are two USB 2.0 ports, audio in/out jacks, an external video port, an RJ-45 jack for the integrated 10/100/1000 gigabit LAN, and a docking connector. There are two speakersons as well as Motion’s terrific multi-directional array microphone design that intelligently switches between two of its three microphones depending on screen orientation (which can be set to happen automatically via accelerometers). There is no DVI-D port (but you get one in the optional FlexDock) or Motion accessory port. Above you can see the left and right side of the J3500.

For expansion, the J3500 has a single Express Card 34 slot and an optional Smart Card slot. With space at a premium and both USB and Express Card SD adapters, Motion decided to forego a separate SD slot. A SIM card slot can be found under one of the batteries.

For communications, there is a Centrino Ultimate-N 6300 802.11a/b/g/n WiFi module and Bluetooth 2.1 + EDR. Optionally available is Mobile Broadband powered by Gobi, now in the form of the Gobi2000 module. Gobi (Global Mobile Internet technology) is a Qualcomm wireless technology that supports the various wireless networking technologies around the world, so users can select whatever carrier is available to them.

Recessed hardware controls (including a PDA-size navigation pad) with embossed symbolic slides are tiny and require a firm touch to operate.

Ruggedness

A degree of ruggedness has pretty much become a requirement in computers being used in the field. Vertical market customers abhor the high failure rates of consumer notebooks and the productivity loss incurred by equipment downtime even after minor accidents. As a result, tablets like the J3500 are now expected to absorb a degree of abuse and the kind of accidents typical for their intended use and working environment. That means the J3500 should be able to survive a fall from the seat of a vehicle, a drop to the ground while being carried, and getting rained on a bit.

As is, the Motion J3500 tablet is sealed to IP52 specifications. That means it keeps dust from getting inside the computer and can also handle water spray falling onto the device. As far as temperature goes, the recommended operating range is 41 to 113 degrees Fahrenheit. Units also can handle 8-30% non-condensing humidity, and altitudes of up to 15,000 feet with SSD and 10,000 feet with a hard disk. While Motion said the predecessor J3400 could handle a 36-inch drop to plywood over concrete, no such claim is listed in the J3500’s specs. An oversight?

Design hasn’t changed, and there’s still an elas- tomer overmolded bottom case that cushions shock, seals seams, and insulates for a cool, non-slip grip. Inside is a rigid magnesium frame that makes for a strong, solid base for mounting and attaching components, using replaceable strap mounts where it matters. The design philosophy here is to use strength where it matters, and “give” where that’s a better approach. A “floating” foam mount for the LCD avoids stress, and despite the J3500’s slender design, there is enough space to allow some flexing instead of transmitting blunt force to the rigid frame.

Also inherited from the J3400 are a number of intelligent details. The two batteries, for example, have molded elastomer “tips” along the perimeter to keep water out. Microphones and speakers are protected from water with special water-sealing membranes that do not affect functionality. Special elastomer guards behind the hardware buttons also seal against water.

This “strength and give” approach to design is carried on down to components. The ExpressCard expansion bay, for example, is attached to the magnesium frame via replaceable, shock-absorbing flex mounts.

Keyboard/stand and FlexDock

The J3500’s very thin keyboard/stand has the same design and uses the same materials as the tablet, so it definitely looks like it belongs to the machine. The keyboard opens to reveal the keys and a stand.

The QWERTY part of the keyboard is 94%-scale, which makes for a slightly cramped feeling that can throw off touch-typists. The distance between the center of the letter “Q” on the left and the letter “P” on the right is 5.7 inches on a full-scale keyboard. Here the distance is only 3.675 inches. That could have been fixed by making the punctuation keys a bit narrower, the same way the keyboard’s designers made the period and comma keys a bit narrower in order to have an ergonomically correct navigation diamond. Not making the QWERTY part of smaller keyboards wide enough is something I often find on mobile keyboards, and I cannot explain in any other way than assuming Asian language designers (who use an entirely different input method where touch-
Motivation Computing Motion J3500: Summary

The J3500 from Motion Computing is a sleek, slender full-featured, full-power tablet computer that has taken a major step forward in terms of computing power and usability.

An approximately 40% overall performance increase compared to the predecessor model comes courtesy of an ultra low voltage Intel Core i7 processor that incurs no penalty in battery life. In fact, between the very efficient processor design and Windows 7’s excellent power management, the J3500 can well meet Motion’s 7-hour estimate.

A substantial functionality increase comes via Motion’s new capacitive dual touch technology that combines projected capacitive multi-touch for effortless swiping, pinching and rotating, with a standard electromagnetic Wacom pen digitizer for precision work. Switching between the two is automatic, and the system is a pleasure to use.

The J3500’s 12.1” wide-format display is among the very best, with a perfect 180 degree viewing angle from all directions, and excellent indoor as well as outdoor performance. The display surface is also much less smudge-prone than before. Virtually unbreakable "Gorilla" glass is available as an option, though not in conjunction with the capacitive digitizer.

The new model also benefits from the availability of more RAM and larger disks, both of the rotating and solid state variety. The J3500 also has an integrated biometric fingerprint sensor, an 8-megapixel integrated camera with auto focus, an optional Gobi2000 wireless broadband module and GPS, a very good convertible keyboard, good onboard connectivity and expansion, Motion’s Speak Anywhere multi-directional array microphones with their excellent noise cancellation technology, and a SIM card slot.

With the addition of the new Intel Core processors and very functional capacitive multi touch, Motion Computing now offers an advanced tablet platform for those who need full Windows 7 functionality but also wish to explore the effortless elegance and potential productivity enhancements of a multi touch interface.

– Conrad H. Blickenstorfer, Editor-in-Chief, RuggedPCReview