MobileDemand xTablet T1180

IMPRESSIVELY RUGGED INTEL 8TH GENERATION "AMBER LAKE" CORE POWERED 10.1-INCH WINDOWS 10 TABLET FOR HEAVY-DUTY MOBILE WORKFORCE APPLICATIONS, INDOORS OR OUTDOORS

by Conrad H. Blickenstorfer; photography by Carol Cotton

Tablets have revolutionized the way we use computers. Not as much as smartphones, but annual tablet sales are now almost as much as laptop computer sales. In terms of numbers, 144 million tablets, 166 million laptops, and 1.37 billion smartphones.

Comparing tablets to laptops, of course, is a bit like comparing apples and oranges, because the two are not used the same way. However, the tablet form factor is here to stay. It is very popular and tablets are increasingly used for work that was traditionally done on desktop and laptop computers. Iowa-based MobileDemand has been a believer in tablets for almost two decades, well before the iPhone and iPad. The company, an innovator in the field, has been growing fast, and it exclusively focuses on rugged tablets.

After building a business based on fully rugged high end tablets for specific vertical markets, MobileDemand expanded into more affordable tablets suitable for a variety of tasks and deployments. At the low end there is the economically priced "Flex" line of generic Windows tablets prepackaged with a custom-designed protective case. Above that are value-priced rugged tablets geared towards vertical markets. And MobileDemand also bundles Microsoft Surface Pro tablets with their own rugged case.

The lineup below shows how the new xTablet T1180 visually compares to other MobileDemand products. From left to right, the 6-inch A680, the 8-inch T8650, the 10.1-inch Flex 10B, the also 10.1-inch T1150 (a lower power version of the T1180), the T1180, the higher-end 11.6-inch T1680, and then the 12.2-inch T1270.

Each product fills a specific purpose and need. Note that MobileDemand also offers Android versions of some of the tablets. In addition to the small A680 shown the lineup, as of late 2020 this includes the A1150 and A1180 10-inch tablets based on the same platform as the Windows-powered T1150 and T1180.

Size and weight matter

Why so many different tablets? Because with tablets, one size rarely fits all. Apple started with one iPad but then added many different iPads models. MobileDemand did that as well. With tablets, size matters. There's a big difference between small tablets used like smartphones, and larger ones for real work. Functionality aside, size also affects how handy and mobile tablets are. A small tablet can go anywhere. A large-screen tablet is much heavier and bulkier, and handles more like a laptop. And that's why MobileDemand offer different tablets with different levels of performance and functionality.

Serious tool for the job

The xTablet T1180 certainly makes a very good first impression. Whereas the Flex models are generic tablets in a case, the T1180 is a true rugged design both inside and out. It looks and feels like a serious tool for the job, one designed from the ground up to handle the bumps and drops that happen in the field.

There are big bumpers on all four corners, the kind that provide real-word protection. There are all the doors, compartments, locks, hooks, loops and mounting points and details that one expects on a rugged tablet. There's nothing wrong with the gleaming sleekness of premium consumer tablets, but they don't work well out there on the job. With the xTablet T1180, form follows function, and not fashion.

Despite being in the same 10-inch display class as the standard Apple iPad, the T1180 is a considerably larger and heftier device. Some of that extra heft and size is due to built-in protection, another to the presence of ports and integrated functionality. The display's 16:10 aspect ratio is pleasant to our eyes, between the iPad's squarish 4:3 and the wide 16:9 aspect ratio favored by many non-Apple tablets. The xTablet T1180 looks large enough for real work.

One look at the xTablet T1180 is enough to see that this is a rugged machine and not something retrofitted for extra duty. The designers combined a contemporary tablet look with the functionality and features asked of a rugged tablet. Most current consumer smartphones and tablets have displays taking up the entire front of a device. That makes them damage-prone and not very practical. The T1180, on the other hand, has a margin around the display that's large enough to allow for a flush front glass surface for easy touch operation, and allows for holding of the tablet without blocking part or the LCD. The LCD itself is recessed a bit from the housing bezel, just enough for MobileDemand to add a fairly thick screen protector.

Along the top of the display are the on/off/sleep button and volume up/down rocker. A protected standard 3.5mm audio port is there, as well as loops for the carry handle, indents for use with a vehicle dock, screw holes for attaching optional modules, and the scanner window. The front shows the ambient light sensor and two alignment markers for inserting the tablet into a dock. A small, but very valuable detail.

On the bottom is the surface mount docking connector, flanked by two holes for secure mounting on one of the docking options. With the exception of the audio jack, all I/O is on the right side, with each I/O port having its own separate protective rubber/plastic door. The doors provide a good, tight seal. They are easy to open and close.

Note that the xTablet T1180, despite its high performance, doesn't have (nor need) a fan. It operates silently and that's a big plus in office settings. And not having a fan means not having to worry about a mechanical component that can get clogged or fail.

Built to be tough and rugged

Unlike the entry-level Flex line of tablets that embed consumer tablets in protective shells, the high-performance xTablet T1180 is built from the ground up as a rugged system. It's a well sealed unit that doesn't require a case to hold up under extreme conditions.

The difference between consumer design and rugged machinery is evident in the T1180. While most of today's consumer tablets can't even be opened anymore, the xTablet T1180 has four externally accessible openings that allow customization with various modules and components. The battery, too, can easily be replaced. And there's a snap-mount anchor for quick insertion and removal into mounting systems.

In terms of construction, the xTablet T1180 consists of a polycarbonate plastic housing with an internal magnesium chassis that's secured to the front of the housing. Mounted on the chassis are the LCD on one side and motherboard, components and modules on the other. The front of the housing looks like a shallow open box. The flat rear part is covered in many areas for reinforcement.

Should the need arise to open up the tablet, remove the four bumper assemblies, undo 16 small Philips screws and separate the halves. With the exception of the small hot-swap battery that plugs into the motherboard, there are no cables or ribbons between the two halves.

Sealing between the two parts of the housing is of a tongue-and-groove design, with a hard plastic lip on the front part of the housing pressing against a replaceable o-ring seal sitting inside a groove around the perimeter of the backplate.

The big 68 watt-hour rechargeable Li-Ion battery of the T1180 snaps into its compartment, but doesn't fit flush like the 40 watt-hour pack that was standard on prior versions of the platform (and is still used in the Android-base A1180). The battery has its own friction seal, which is necessary as the battery compartment includes not only the battery terminal openings into the interior of the tablet, but also openings for the unit's microSD and micro SIM slots.

The battery is secured in place with a spring-loaded lever that can be locked in place. The battery, which is hot-swappable, is unlikely to come loose during operation.

Unlike the interior of many Windows tablets, which are jam-packed full of electronics, the T1180 looks remarkably tidy inside. The L-shaped motherboard is much larger than inside earlier Intel Atom-based version of the tablet. Much of the board is covered up with black foil, and a number of circuits sit underneath EMI shielding.

There's a half-size mini PCIe slot for a mobile broadband module. Antennae and their wiring are already pre-installed. WiFi and Bluetooth are handled via an Intel 9260NGW module. Almost all I/O is edge-mounted on the motherboard, exceptions being the surface-mount docking connector and the standard 3.5mm audio jack. This is a very highly integrated and professionally executed design.

The interior layout is visually dominated by miniaturized ribbon cables that connect the motherboard to the antennae, cameras, speakers, and other items mounted inside the T1180. The two speakers, the 1D/2D barcode scanner and the camera module all have their own separate cubbies on the magnesium chassis. We also found a USB Type-C plug inside.

Our Flir One infrared camera showed the thermal situation inside the xTablet T1180, with darker areas the coolest and bright yellow the hottest. Since the xTablet T1180 doesn't have a fan to remove heat, good thermal management is essential. The processor area is where it gets the hottest. In our performance benchmark testing, we measured a maximum surface temperature of 86F, not even human body temperature.

As far as protection goes, each of the tablet's peripheral ports has its own protective door with a friction seal. These individual port covers are all cut from one piece of rubbery material, which can easily be replaced. For drop/bump protection, the plastic housing has a rubbery protective layer that goes around the entire perimeter of the tablet, and also has small integrated corner bumpers. These areas contain anchors for larger bumpers that screw on.

If the extra protection afforded by the heavy duty bumpers is not needed, they can be taken off and the tablet can be used without them, making for a smaller footprint.

The inside of the xTablet T1180 reveals many interesting details. There's the tablet's tiny camera and LED illuminator snuggly sitting in their own cubby in the metal chassis. The design of the two-part protective corner bumpers that are individually replaceable. The tiny 1D/2D industrial grade barcode reader. There are smartphone apps that read barcodes with the phone camera, but having a dedicated scanner is much faster and much more accurate.

The battery must be removed to get at the tablet's micro SIM and micro SD cards, which isn't ideal. A small battery makes hot-swapping of the main battery possible. The seal between the two housing halves is replaceable whould it wear or break.

Overall, the insides of the xTablet T1180 show a complete, powerful PC stuffed into a small space, but much of the componentry and electronics have been miniaturized more like those in a consumer tablet. Quality is very high, with good fit and finish.

Very good performer

The xTablet T1180 runs Windows 10 Professional on an Intel Core i5-8200Y processor. This is a dual-core/quad-thread chip that is part of Intel's 14nm 8th Generation "Amber Lake" lineup of extremely-low power (as in consuming very little power) processors. The integrated Intel HD Graphics 615 Gen 9.5 GT2 have 24 execution units, a graphics base frequency of 300MHz and they top out at 950MHz.

Where does the "Y" suffix come from? That indicates that the processor is designed to draw as little power as possible when it's just idling along or doing routine work, but it's still capable of short "turbo" bursts at frequencies of up to 3.9GHz to tackle complex work. Desktop processors may have maximum draws from 65 to over 100 watts. Most laptops use "U" Series processors that draw as much as 15 watts. The "Y" Series draws no more than 5 watts. These chips are designed to be the best of both worlds: they are power-efficient, but still capable of high performance.

The table shows our benchmark results for the MobileDemand xTablet T1180 and the older xTablet T1150, the xTablet Flex 10B, the Durabook U11L, and the Zebra ET56.

The results should not be read as what is better or worse. Different processors and setups have different performance and different costs. Each has its place and purpose. What we're showing here is how different types and generation of processors and technologies impact bottomline benchmark performance.

As expected, there is a big performance difference between even the latest Intel Atom and Celeron chips, and the Intel's far more complex and expensive Core processors. And there's also a big difference between the different types of Atom processors Intel offers.

Performance boosts often come from unexpected places. It is not just the processor that matters. Almost every applications has to read or write data from disk during operation. While rotating disks have largely been replaced by much faster solid state storage, that technology also comes in different varieties. FInitially, solid state storage used the SATA interface, but now SATA is increasingly replaced with the much faster PCIe NVM2 interface. MobileDemand uses that in the T1180, and just look at the its speed!

While MobileDemand considers the T1180 as part of their high-performance lineup, it *is* using a super-low-voltage Y-series chip. If more speed is needed, there are the higher voltage U-Series chips that also come in quad-core versions (like in MobileDemand's T1680), and tablets so equipped are, of course, that much faster yet.

What impact does the frugal Y-Series processor have on battery draw and battery life? MobileDemand claims up to 10 hours from a full charge of the beefy 68 watt-hour battery. We used PassMark's BatteryMon utility to find out.

With the tablet set to the Windows "Best battery life" mode and the display backlight set to its lowest, we saw a power draw of 3.3 watts. With the backlight set to medium, we saw 4.0 watts, and with the backlight set to its brightest setting, power draw rose to 5.6 watts.

In the Windows "Best performance" setting, we found a low of 3.7 watts at the lowest backlight setting, 4.4 watt with average backlight, and 5.6 watts with the backlight at its highest. These number suggest that the xTablet T1180 could easily meet and exceed MobileDemand's estimates.

MobileDemand xTablet T1180 Power Draws (at idle)			
Backlight level	0%	50%	100%
Power Saver	3.3 watts (20.6 hrs)	4.0 watts (17.0 hrs)	5.6 watts (12.1 hrs)
Max Performance	3.7 watts (18.4 hrs)	4.4 watts (15.5 hrs)	5.6 watts (12.1 hrs)

Great display and multi-touch

MobileDemand made a name for itself as a provider good of rugged tablet technology and tablet solutions at affordable prices. But the reasonable pricing came never at the expense of quality and features that matter to customers. If an inexpensive processor gets the job done, MobileDemand won't spend 15 times as much on a high-end CPU. If, however, high performance is required, they use the very best. Makes sense. And they will never skimp when it comes to displays. A good display is crucial for work out there in the field.

So it's no surprise that the T1180 has an excellent display. Measuring 10.1 inches diagonally it's better suited for serious Microsoft Windows work than smaller tablets. It offers 1920 x 1200 pixel resolution in 16:10 wide-format. That's three times as many pixels as the 1024 x 768 XGA format that was commonly used in rugged tablets (even ones with larger screen sizes) for many years, and is still being used today.

On a 10.1-inch tablet screen, 1920 x 1200 translates into 224 points per inch (ppi), which is in the same range as Apple's "retina" MacBooks. That means even small text looks sharp and crisp on the display.

The xTablet T1180 uses 10-point projected capacitive multi-touch for effortless tapping, panning, pinching and zooming. While we've never been fans of capacitive touch on very small Windows tablets, it is much less of an issue on a larger display like the T1180's.

In everyday use, the display works very well. The spec sheet claims 550 nits luminance. We measured just under 500, which may be due to the T1180's screen protector. To put that in perspective, most standard laptops offer around 250 nits, iPads are generally in the 400 nits range, and displays specially built for direct sunlight use may have over 1,000 nits.

Subjectively, the T1180 screen looks bright and vibrant indoors. The pictures above show what you can expect outdoors from the T1180. Like almost all modern tablets, the T1180 has a glossy display surface, so there can be reflections. If that is an issue, MobileDemand offers an anti-glare screen protector.

A wide viewing angle is crucial for a satisfying, non-disruptive viewing experience. Older and lesser display technologies can be prone to dramatic color and contrast shifts when viewed from different angles. The xTablet T1180's display is immune to such shifts, which makes it a pleasure to use.

PassMark 6.1	MobileDemand	MobileDemand	MobileDemand	Durabook	Zebra
Model	xTablet T1180 (2020)	xTablet T1150 (2017)	xTablet Flex 10B (2020)	U11L (2020)	ET56 (2019)
Year tested	2020	2017	2020	2020	2019
Processor Type	Intel Core	Intel Atom	Intel Celeron	Intel Core	Intel Atom
Processor Model	i5-8200Y	X5-Z8550	N4100	i5-10210Y	x5-E3940
CPU Speed default/turbo	1.30/3.90GHz	1.44/2.40GHz	1.10/2.40GHz	1.00/4.00GHz	1.60/1.80GHz
Thermal Design Power	5 watts	2 watts	6 watts	7 watts	9.5 watts
CPU Mark 6.1	3,483.7	1,669.7	6,197.8	5,820.9	3,986.7
2D Graphics Mark 6.1	355.4	96.7	188.7	333.3	159.1
Memory Mark 6.1	1,221.1	434.2	607.2	1,395.3	440.3
Disk Mark 6.1	8,999.6	802.6	463.4	2,928.8	1,188.4
3D Graphics Mark 6.1	425.7	235.3	258.1	407.9	267.3
Overall PassMark 6.1	**3,061.2**	**731.3**	**1,945.3**	**2,504.2**	**1,447.7**
CPU Mark 9	4,007.2	NA	2,555.7	5,826.3	1,858.5
2D Graphics Mark 9	487.0	NA	327.8	510.4	181.7
Memory Mark 9	2,085.1	NA	798.4	2,073.1	781.7
Disk Mark 9	13,920.6	NA	682.2	3,037.8	1,356.4
3D Graphics Mark 9	786.5	NA	479.1	783.5	405.5
Overall PassMark 9	**2,386.9**	**NA**	**1,145.6**	**2,467.4**	**955.2**
CrystalMark					
ALU	39,558	29,672	46,486	47,778	30,953
FPU	30,399	21,437	29,498	34,385	27,937
MEM	39,515	23,865	25,958	51,571	33,470
HDD	62,917	17,861	24,853	37,842	26,250
GDI	14,489	3,569	8,312	13,993	2,818
D2D	5,186	3,039	3,541	4,367	4,005
OGL	7,957	3,410	4,811	7,753	3,845
Overall CrystalMark	**200,221**	**103,912**	**143,459**	**197,689**	**129,273**

Competent cameras

Smartphones have replaced point & shoot cameras, and they are increasingly used even for serious photography. As a result, today's professionals and field workers expect their handhelds and tablets to shoot pictures and video good enough for work.

The xTablet T1180 has two integrated cameras. The user-facing 2mp camera is for video conferencing, whereas the rear-facing 8mp camera with LED flash can be used for documentation purposes.

Cameras integrated into handheld and tablet computers have historically underperformed compared to even low-end dedicated cameras and, more recently, the cameras available in virtually every smartphone. Things have gotten better, but usually not enough to eliminate the need of taking along a dedicated camera or smartphone if imaging is needed on the job.

When we reviewed the xTablet T1150 a while ago, we criticized the barebones Windows Camera app. The Camera app in the T1180 offered more options — including a "pro mode" with exposure, white balance, and manual focus settings. But system integrators and many customers may still miss the wealth of features available in smartphone cameras these days.

As is, the T1180 documentation camera offers seven still image resolutions from 0.4mp to full 8.0mp, and video can be taken in four resolutions from 480p to 1080p, all at 30 frames per second. Auto-focus worked fine, images were surprisingly crisp and sharp, and the camera does not over-compress images. Video was sharp enough for almost all purposes and did not lag behind.

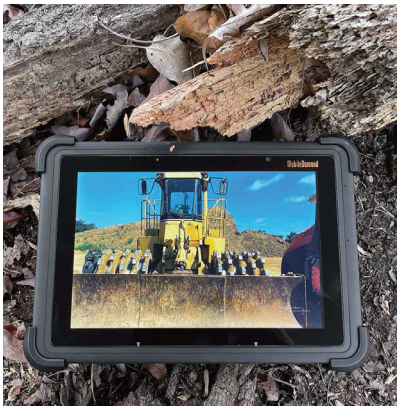
The front camera shoots 0.03mp to 1.9mp still images and has six video resolutions, from 120p to 720p.

The T1180's documentation camera is suitable for most documentation tasks, both in still shots and in video. It's nice to have the big 10-inch screen as a viewfinder. Pictures actually come out a lot sharper than they appear on the screen. There is, however a slight lag between pressing the shutter and the image being taken.

Note that MobileDemand also offers an optional external Intel RealSense D415 3D camera with depth technology, and Intel's L515 LiDAR camera and D455 Depth camera are also supported.

This would bring spatial awareness to the T1180, and that can be used for an emerging range of very interesting and productivity-enhancing 3D measuring applications.

xTablet T1180



With the xTablet T1180, MobileDemand offers a compelling "mid-range" rugged tablet. The device offers serious processing muscle as well as options not available in the company's lower-end products.

The xTablet T1180 was designed from the ground up as a rugged tablet. It can be equipped with an integrated industrial-grade scanner, dedicated GPS, as well as an Intel 3D RealSense camera option for an emerging range of productivity-enhancing Depth and LiDAR-based 3D measuring applications.

Weighing in at under three pounds as tested, MobileDemand's xTablet T1180 provides an attractive proposition for customers who want the convenience and ease of use of a 10-inch class tablet in package that's well-equipped and well-protected but costs less than premium rugged tablets.

The tablet's powerful Intel 8th Generation "Amber Lake" Core processor packs plenty of punch while still running cool and without the need of a fan. The T1180 also impresses with a crisp, sharp, bright and vibrant 10.1-inch 1920 x 1200 pixel display with perfect viewing angle from all directions and no color or contrast shifts. Its 10-point capacitive multi-touch screen is quick and very responsive, and works very well with Windows 10 and touch-optimized applications.

Onboard connectivity including two full-size USB 3.0 ports, micro-HDMI, and an RJ45 LAN jack. The 2mp and 8mp cameras are suitable for conferencing and documentation. There is a powerful user-accessible and replaceable hot-swappable battery.

The tablet's high quality rubber and polycarbonate casing is well designed. Protective bumpers and port plugs are effective and can easily be replaced. The tablet is well sealed, can survive steep drops unharmed, and the operating temperature range of the tablet is wide enough for virtually any application.

All of this makes the xTablet T1180 a compelling package for anyone who needs Windows on tough jobs, even those that require high-level sealing, high resolution, GPS, and industrial-grade scanning. – *Conrad H. Blickenstorfer, December 2020*

xTablet T1180 Specs

Type: Rugged tablet computer
Processor: Dual-core Intel "Amber Lake Y" Core i5-8200Y, 1.30GHz, 3.90GHz turbo frequency
Graphics: Intel UHD Graphics 615, 300-950MHz
OS: Windows 10 Professional
Memory: 8GB or 16GB LPDDR3
Display: 10.1-inch, 1920 x 1200 pixel, 550 nits
Digitizer: 10-point capacitive multi-touch with stylus, glove and wet-touch support
Keyboard: Onscreen keyboard + optional external)
Storage: 256GB or 512GB M.2 PCIe NVMe solid state disk
Slots: 1 x micro SDXC card, 1 x microSIM
Housing: Polycarbonate housing with integrated and replaceable protective rubber bumpers, magnesium internal frame
Operating temperature: 14°F to 122°F (-10°C to 50°C)
Ingress protection: IP65
Drop: 5-foot drop per MIL-STD-810H
Vibration: 2MM from 10 to 33Hz in all three axes, 1 hr/axis
Regulatory: FCC, CE, and IC
Size: 11.16 x 7.56 x 0.87 inches (295 x 192 x 22 mm)
Weight: 2.64 lbs in base config; 3.3 lbs. as tested
Power: Rechargeable, replaceable 7.2V 9,450mAH 58 watt-hour Li-Ion ("up to 10 hrs")
Sensors: 9 Axis MEMS sensor (gravity acceleration, eCompass, gyroscope), ambient light, proximity
Data capture: Optional:NFC module, 1D/2D barcode reader
Cameras: 2mp front, 8mp AF with LED flash rear; optional Intel RealSense D415 3D camera
Communication: 802.11 a/b/g/n/ac WiFi, Bluetooth 5.0, uBlox NEO-M8N GPS; optional: NFC module, 1D/2D barcode reader, 4G LTE (Sierra Wireless EM-7565)S
Interface: 2 x USB 3.0, 1 x micro HDMI, 1 x RJ45 LAN, headphone jack, power, docking
Warranty: 1 year warranty with extended warranty and extended service plans available
Price: Starting at US$1,995

Contact:

MobileDemand
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Tough enough for the job

The major reason why customers opt for a rugged tablet is, obviously, ruggedness. The tablet must be able to handle the inevitable bumps and grinds and exposure on the job. What can you expect from the T1180?

As far as the ever important drop spec goes, the T1180 exceeds the MIL-STD 810G, 516.6 IV gold standard that mandates 26 repeated drops to one operating unit onto plywood over concrete from 48 inches. Why 48 inches? Because if a tablet is dropped while it's being used in a standing or walking position, it'll drop about four feet. The xTablet T1180 can actually handle those drops from five feet. Kudos.

The operating temperature range is 14° to 122°F, which covers most potential applications out there.

The biggest difference between both the xTablet T1180 and the xTablet Flex 10B is in the sealing of the units against the elements. Despite its protective casing and nicely implemented protective rubber plug for all I/O ports, the Flex 10B isn't considered a sealed unit and does not have an ingress protection rating. That means no working in the rain. The xTablet T1180, on the other hand, carries a respectable IP65 rating. That means they're totally dustproof and can also handle low pressure water jets from all directions. That'll do for virtually all deployments.

Mounting and docking option

Most tablets used in business or on the job come with some kind of docking and mounting options, and the xTablet T1180 is no different. Available are a desktop docking station, a vehicle dock, and very handy quick-release mounting options.

We had a chance to test the available heavy-duty RAM Mount setup and loved it. Flimsy mounting options can be quite frustrating due to vibrations and flex. No such problems with this setup. Super-easy to adjust any which way (see below), and absolutely solid as a rock. Highly recommended.