

SKELLIT®, wearable and practical IT

Tablets and smartphones are handheld devices, but why still? Using one hand to hold it and the other to operate the touchscreen may as well be acceptable for Facebook or Tinder, but not when you actually have to work. Using them constantly and outdoors still drains the battery way sooner than half of a working day, so you also have to juggle a dangling power bank. Going in and out of bags and pockets, giving you grief with their charge cables all the time is not the way to go.



- „Handheld“: the key is in the true meaning, now it's always in your hands, while it has grown bigger and bigger over the years, smartphones have long passed the pocketable sizes
- Both hands are full, there's no decent way to carry other stuff or to hold on to anything
- There's still not enough juice in the battery for high CPU loads and full backlighting outdoors
- Dangling power bank or desperate search for a charger, will you reach the next charger in time?

Broken screens and torn connectors tell you the whole story. There's a constant need for repairs, or rather a replacement, which result in an extremely high TCO (or Total Cost of Ownership). Other consequences are the many related workplace accidents, downtime and loss of revenue.

„Wearability“ 101

Many people have tried to find solutions to these issues over the years, but they have all failed. Even the ones that may seem to work at first glance are not working at all in real life, and none of them solve all these problems. The fact that these devices should always be at hand ready for action, but never in the way was too much to ask for. Comfortable screen visibility is a primary objective, just as mechanical protection and the option of connecting an external power source or even peripherals.

While wearability means a completely different thing today than even 10 years ago (i.e. wearable PC), that's what we're looking for exactly. Still, most designers thought it was a good idea to mount a smartphone on your wrist, but there are major flaws in this approach:

- even a simple glance needs hand movement, handling needs both of them
- the wrist is not a protected area of your body, it's easy to smash it into anything
- a wrist mounted object hinder hand and arm movement with its weight and dimensions
- it moves around a lot, so it's hard to look at continuously
- it's hard to connect power or peripherals, because
 - cables through the sleeves hinder movement
 - huge differences in cable lengths should be covered between the torso and your wrist



It's easy to understand why these funny ideas haven't ever become an everyday reality. Only smartwatches are OK on the wrist where ordinary watches were also fine, needing only a casual glance at a time. There's one area of the body that is accessible at most times and in most postures, and that's the chest, or the sternum in particular. Being close to the centre of gravity, it's also the most stable, and our hands are already used to operate in front of it. We've seen many interesting chest mount attempts as well, but none of them worked out too well.



You can clearly see what the issues are here, even though a considerable effort went into creating these products. Still, if it's not made for the particular tablet or phone, it will be cumbersome and heavy. You'll also need a protective bag or box if you're not using a rugged device already, and those straps are always in the way, no matter what.

Our wearable rugged smartphone and tablet started out as the core of our extremely light drone controller product, so we can't deny its real military lineage. However, such a chest mount system has a logical place in all industrial and civilian applications. The perfect weatherproof implementation of wired connectivity with full integration to your workwear, or in fact to any ordinary piece of clothing are the key aspects here. Let's give the word "wearable" its true meaning, really, it's not just a poxy smartwatch, but the real gear, on you.

The attachment to your body is just a snap with the truly universal MOLLE/PALS standard, and the phone itself can go in and out of SKELLIT just as easily using just one hand. Hi-Viz vests, outdoor wear and backpack straps already make this a viable everyday ergonomic reality, but even four button holes are enough to attach it to any clothes.



There are now many types of outdoor garments available with MOLLE compatible webbing patterns, and we can already use various stock high visibility MOLLE vests especially for industrial applications. Since the traditional chest mounts were first used for admin packs, there are also a very high number of stand-alone PALS pattern flexible chest mount plates with their own light harnesses. The nice thing about these plates is that they also work as a chest attachment to any backpack, so they are instantly usable for various outdoor applications.



Still one of the nicest things about SKELLIT is that you don't even need a standard MOLLE webbing pattern on your clothes, as four buttonholes are enough to mount it.



Garment options:

- all work wear can have four buttonholes or 2-3 lines of webbing in the chest area
- overalls, dungarees
- waistcoats, coats, overcoats
- reinforced T-shirt
- zip lock vests, Hi-Viz, blue, etc.
- stand-alone light chest harnesses
- backpack strap front panels

We have already created a whole line of SKELLIT mount solutions to fit various applications, garments and phone/tablet types. There is considerable know-how at many levels of this integration, but one of the most important novelty aspects is secure wired connectivity. Phones and tablets are originally wireless stand-alone devices, meant to be used as handhelds, so the few available wired connections are always in the way. These are also the first components to fail due to stress on the cable or the connector when using them plugged in.

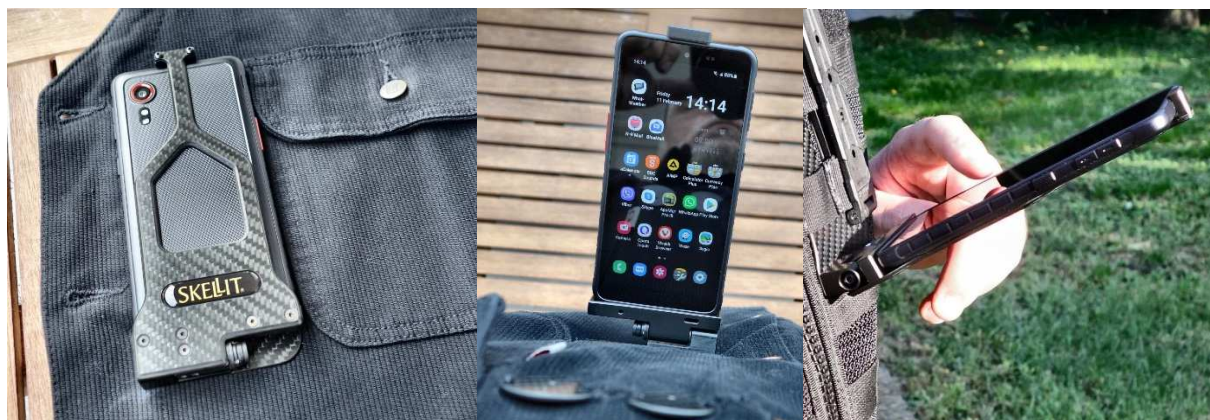


There are numerous industrial applications where the tablet is not used in the field as a stand-alone device, and it cannot connect to a peripheral or the target system wirelessly. In fact, most specialised field instrumentation now comes with companion software that runs on tablets and smartphones. You cannot even reach the full potential of some of these instruments without the software.

This is where most other integrations, outdoor cases and modifications fail in practice. We can connect securely and safely to our mounted tablets through the IP67 grade base. Because the receptacles are right next to and in line with the hinge axis, push-pull locked and protected by both the mount and tablet body, there's no risk of accidental disconnection or connector damage.



None of the target tablets and phones need any modification. We've taken the stock versions and added the rest from the outside, notably to the docking block, so there's no loss of warranty, either. The connectivity electronics includes peripheral power management, so the external devices don't draw power from the tablet itself when not in use. We can provide wired LAN, USB, serial or other standard wired I/O connections depending on what the particular application requires.



The usual limitations apply regarding manufacturers and operating systems, Android and Windows are no problem, iOS devices are perfectly possible, but we try to stay away from them, because they were never intended for rugged industrial applications, and Apple actually makes it deliberately hard to integrate them in any decent field system.

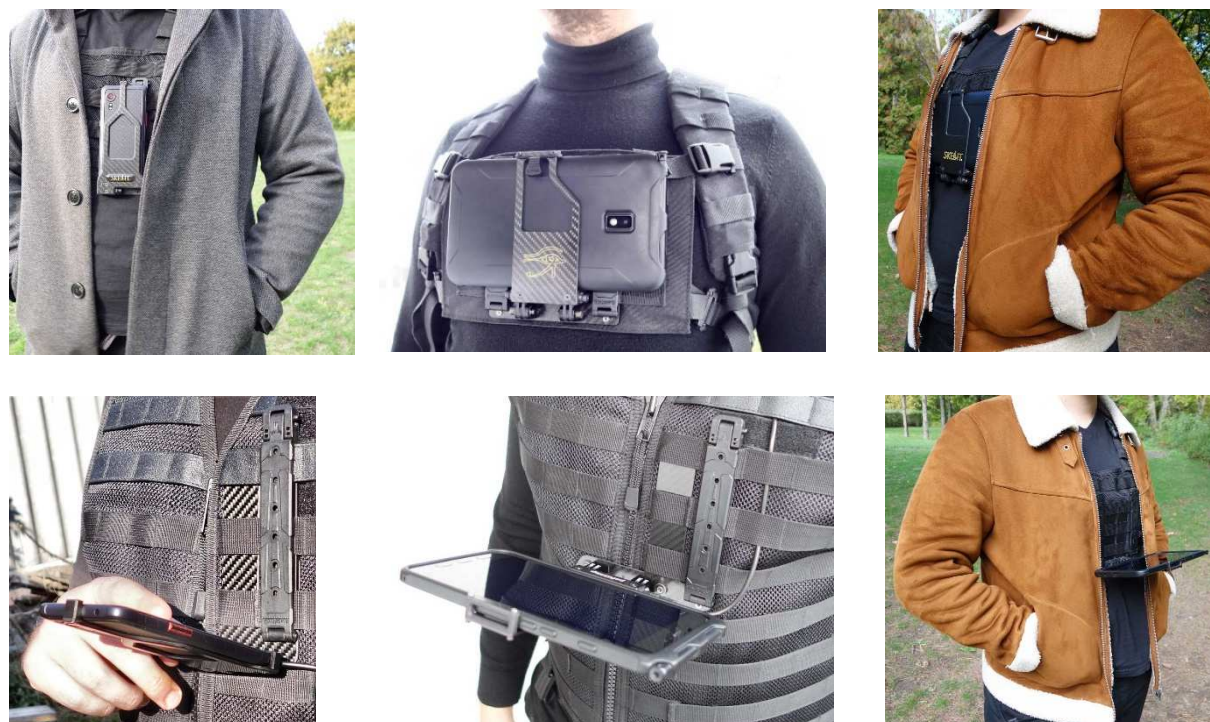
You'll notice that we've used only premium parts, materials and machined components in all our prototypes and production samples. These include high density twill carbon fibre composites, engineering plastics like POM, hard anodised marine grade AL6082, stainless or high tensile 12.9 grade steel hardware, etc. While they are also adding a professional and upmarket look, these materials

are mainly responsible for the durability and extremely low weight of these mounts at 100-200g maximum.

As the entire concept came out of our own personal field experiences, we can simply list the number of peripherals that we attach to phones and tablets in general. Of course, the datalink radio and the handheld controller are the first things that come to mind for UAV and ground robot applications, but we are talking about general industrial applications here.

- SDR modules, at least a dozen different types for spectrum analyser and RF field survey purposes
- any camera, DSLR or otherwise that has a decent companion software
- total station for ground survey jobs
- USB oscilloscope
- portable thermal printer, graphs, receipts, instant hard copies of anything
- long range or close quarters pen type RFID reader
- old style barcode readers for close quarters selection
- wired LAN connection to tap into routers and other network devices
- anything that needs field settings or maintenance through a connected tablet
- anything that needs a field firmware update, etc.

We've developed SKELLIT in three main sizes to be able to serve all applications areas. The lightest is the 6" smartphone version, which is also suitable for various consumer applications with its low profile portrait orientation. Most industrial applications will benefit from the 8" tablet format, but we also have a 10" version typically for PC based solutions.



SKELLIT has a place in all industrial and civilian areas where tablets and smartphones are regularly used as primary tools in the field with or without peripherals. In fact, there are hundreds of applications where you have to struggle with hand-held IT that just gets in and out of the bag all day long. Having IT continuously at hand improves productivity by eliminating downtimes and providing comfortable access.

A few industrial and professional application areas:

- IT and network infrastructure, field maintenance
- Construction
- Mapping and ground survey
- Photography and video production
- Open-pit mining
- Oil and gas
- Renewables
- Forestry and wildlife management
- Warehouse operations, logistics
- RF measurements, LOS, coverage, interference field surveys
- Rail transport operations
- Courier services
- Meter reading
- Marine, shipboard and port operations
- etc.

Prosumer or special private applications:

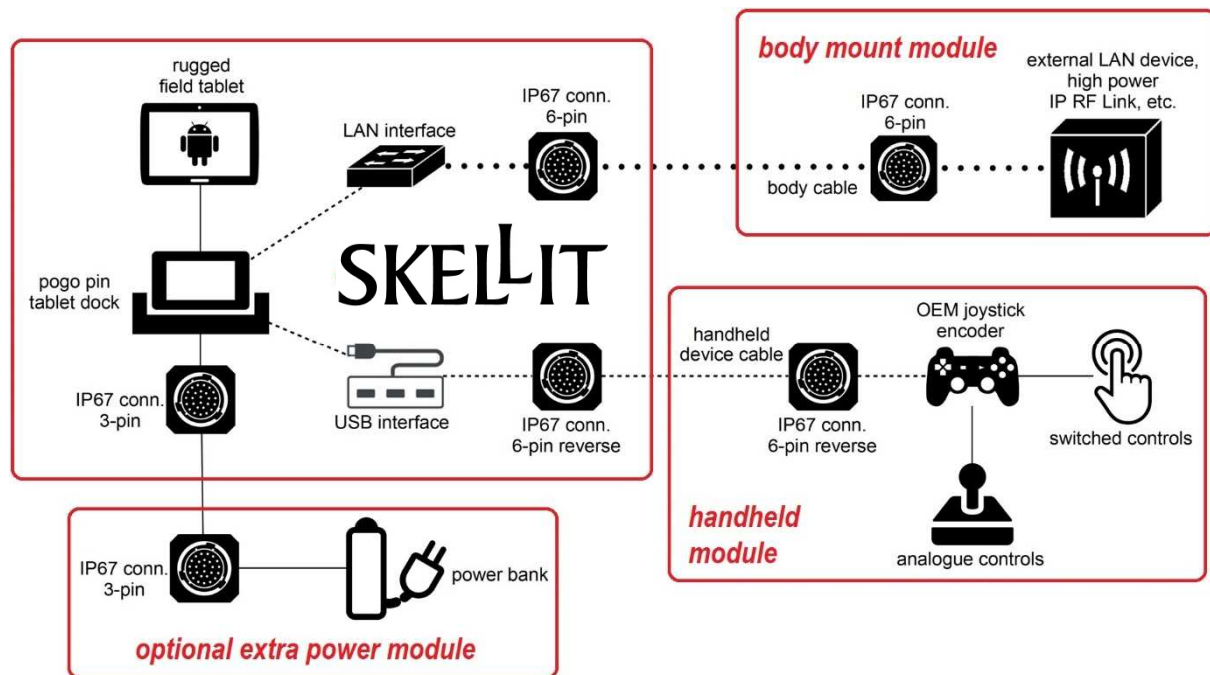
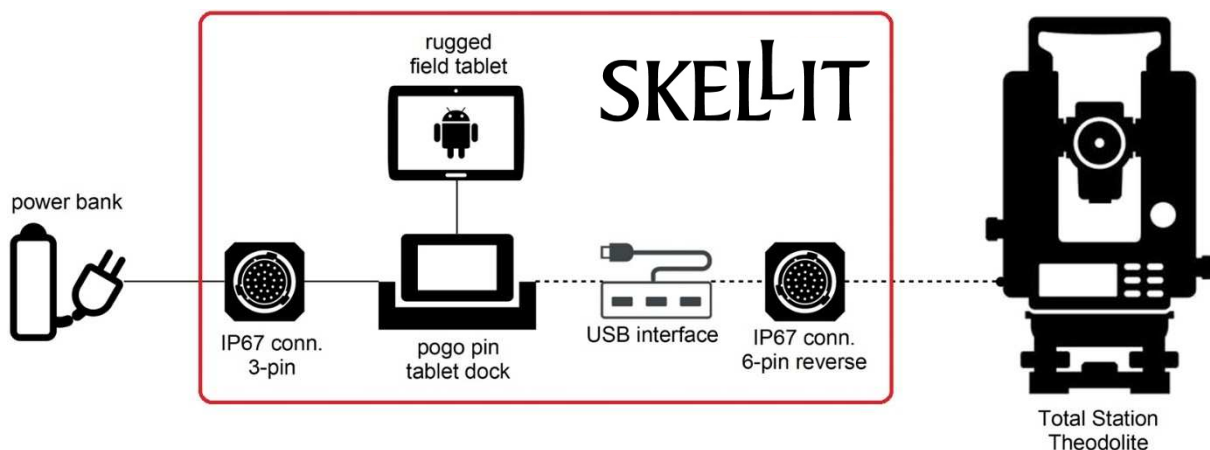
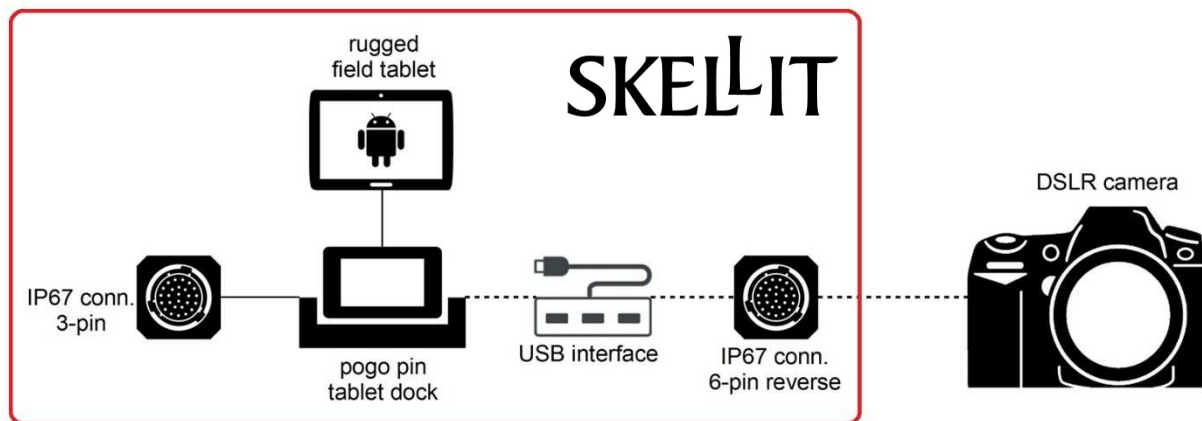
- Accessibility, typically blind assist, many existing machine vision apps...
- Body cam, documentary or evidence gathering
- Remote instruction, assistance and training
- Live streaming, POV
- Airsoft and paintball
- Outdoor activities, hillwalking
- Boating, yachting
- Geocaching
- etc.

Complete ecosystem with ancillary applications

- SKELLIT Vehicle dock, the lightest active dashboard dock for rugged phones and tablets
- SKELLIT Bike, the lightest active handlebar dock, the only one for bikes, really
- SKELLIT HH, handheld drone and robotic remote control using the same docking technology
- SKELLIT Convertible, compact desktop/wearable transformer version. etc.



Industrial application example schematics



SKELLIT fundamentals: pogo pin docking connectors are already there in all professional tablets and phones...









...because that's the only way to connect or dock them in the field thousands of times without any damage to the contacts.