Ruggedized PDAs – How Tough is Enough?

For most consumers and office workers, the Personal Digital Assistant (PDA) has been replaced by the smartphone. But many businesses don't want to provide smartphones to most field employees and are instead using a new breed of "ruggedized business PDA."

What does *rugged* really mean?

For most people, 'rugged' refers to the durability of the device. What if your PDA sits in the rain for a few minutes? What if a foreman drops it onto a concrete floor? Will the dust kicked up by that truck get into the device? All of these things are common in the field.

There are four unofficial categories of equipment protection or ruggedization:

- **Normal** – commercial-grade products not facing rugged conditions
- **Durable** – more resistance to dropping, perhaps spill-proof keyboards
- **Semi-Rugged** – guards against difficult but not extreme environments
- **Fully Rugged** – safeguards conform to the most difficult conditions

The protections that are most commonly sought after by businesses are:

- **Surviving a fall** - Rugged devices are expected to survive several drops of 5 feet or more onto hard surfaces, while semi-rugged devices will withstand fewer drops from lower heights. Durable devices will survive tip-over tests and short falls.
- **Water resistance** – Fully rugged devices can survive full immersion in water for short periods. Rugged and semi-rugged devices are often designed to resist rain, while durable devices might only withstand splashes of liquids.
- **Dust intrusion** – Construction sites can expose PDAs to dust and sand that can cause movable parts to stick and malfunction. Semi-rugged and rugged devices are tested at various levels of airborne dust.
- **High and low temperatures** – Equipment can often sit in the sun and then be taken into an air-conditioned truck cab. The ability to operate at wide temperature ranges and survive the shock of temperature changes are part of testing for ruggedness.
- **Vibration** – A PDA sitting on an operating piece of equipment could experience problems like wire chafing, electrical shorts or shifting of buttons or display components. Vibration tests are part of "torture testing" that ruggedized products go through.

Pharos® 565 Ruggedized PDA

- IP54 rating for dust protection and water resistance
- Tested to resist 4-5 foot drops
- Bluetooth® & infrared tranceivers
- WiFi and USB communication
- Windows® 6.5 operating system

What to look for in a ruggedized PDA

The most common specification found in semi-rugged and rugged devices is the **Ingress Protection (IP)** standard for protection against water and dust. It's a two-digit numeric rating, in which the first digit indicates the amount of protection against dust and the second digit against water. The most widely-used standards are **IP54** and **IP65**. An IP54-rated product is protected against splashing water and has some dust protection, whereas an IP65 device is fully protected against dust and will survive jets of water similar to the product being hand washed. An **IP68**-rated product has the same dust protection but will survive total immersion in water.

The most rugged products are tested against a battery of published design and testing criteria from the U.S. Department of Defense and the U.S. Army. One of the most comprehensive standards is MIL-STD-810F.

The Price of Ruggedness

Part of the reason for the low cost of unprotected PDAs is the very high production volume that they achieved. Today's rugged PDAs sell in fewer numbers and must be designed and tested to much higher standards of durability, so their costs are higher. Semi-rugged PDAs range from $550 up to the $1,200 range. Fully rugged PDAs that pass military standards are often priced over $2,000.

How do you choose?

Most businesses need a semi-rugged product rated IP54 or higher. The price of more ruggedness is often not worth the additional cost. Exaktime has chosen the Pharos 565 as the semi-rugged PDA to run its mobile time and attendance application for field use.

A less expensive option is to take a Normal or Durable PDA and use a protective case like the OtterBox®. At $50-$100, these cases add significant drop protection as well as some water and dust resistance, but they can interfere with operations like keyboard usage and infrared communication.

Paying the extra money up front for a ruggedized device will usually pay off very quickly.

When you're rolling out a technology application in the field, reliability and ease of use are what will make it successful. Purchasing an unprotected commercial grade device might lead to constant replacements; PDAs need some ruggedization to last a long time in business applications like construction. It's usually worth the extra dollars up front to get the ruggedness that you need.