

# So what is rugged?

What does rugged mean? From a user perspective, rugged is really just the computer's ability to keep operating under all exposed working conditions. And not just once, but for the life of the unit, which can easily be 3-5 years. However, depending upon the kind of work being performed, what is rugged for one user may not be rugged for another. For example, a mobile computer in a warehouse is likely to be dropped often and may be exposed to a lot of dust, but is unlikely to face extreme temperatures or rain. On the other hand, a forester will need a unit with protection against water and a wide temperature spec, but is probably not too concerned about dust.

## The right tool for the job

A mobile computer is really just a tool used to help you do your work. So the cardinal rule for a user is: find the right tool for the job. A wise purchaser of a mobile computer will carefully evaluate what kind of working conditions the unit will be exposed to and then dive into product specifications to find a unit that is rugged enough in the right categories to hold up under these conditions. It is also probably a good idea to select a unit, which is a little more rugged than you actually need. It is far better to be too rugged than not rugged enough, and you may at some point encounter conditions more severe than you originally predicted.

## So how is rugged defined?

The level of rugged is best defined by its environmental specifications, and the 3 most common and useful specifications are:

- Temperature range
- MIL-STD-810F/G
- IP

These specifications are almost always listed on the product data sheet.

The temperature spec defines the operational temperature range of the unit. Working with a unit above or below this spec may cause the unit to fail.

MIL-STD-810F/G is a standard issued by the United States Army's Developmental Test Command. The standard consists of a series of various environmental tests to prove that equipment qualified to the standard will survive in the field. They were designed specifically to test military equipment, but are now used to test a wide range of both military and civilian products, including mobile computers.

IP stands for Ingress Protection, and an IP rating is used to specify the level of environmental protection of electrical equipment against solids and liquids. In other words, it tells us what amount of size of solids or liquids can get inside the enclosure and possibly damage the device. It is defined by international standard IEC 60529.

## The MIL-STD testing methods

MIL-STD-810F/G is comprised of about 24 laboratory test methods that cover a wide range of environments, from the ability to perform at high altitude (method 500.4) to the ability to survive ballistic shock (method 522). No mobile computer has been tested to all 24 methods; many of them do not apply to mobile computing. But generally speaking, the more methods tested (and passed), the more rugged the unit. The most rugged units (like the Nautiz X7) have been tested to between 8 and 10 MIL-STD-810F/G methods. Also, when evaluating a data sheet, pay attention to the methods that apply to your situation. If you will be working at over 10,000 feet of elevation, make sure the unit has been tested to the MIL-STD method that covers altitude. If you are going to be working in rapidly changing temperatures, make sure the unit has been tested for temperature shock.

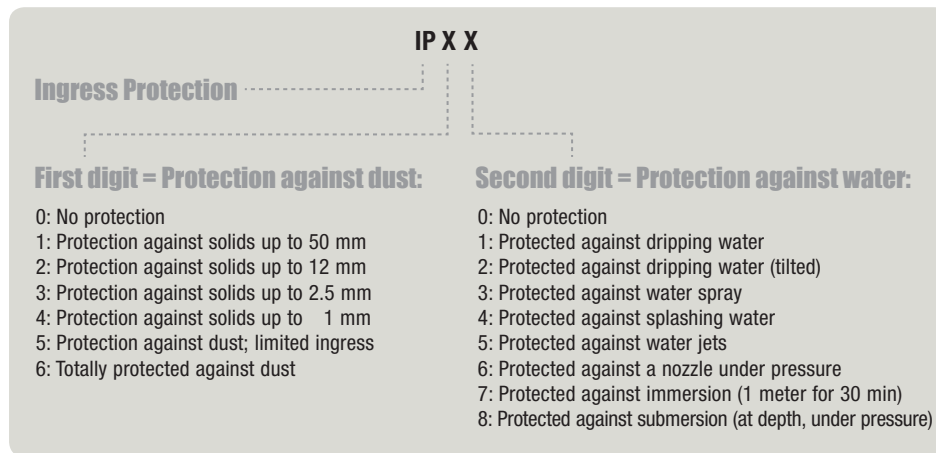


Handheld is a world wide supplier of rugged PDAs and handheld computers. All our products are ruggedized and can withstand water, dust, drops and vast temperature changes. Handheld and its partners deliver complete mobility solutions to businesses in industries such as logistics, forestry, public transportation, construction, military and security.

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## The IP Definitions - What level do you need?

IP ratings are displayed as a 2 digit number. The first digit reflects the level of protection against dust. The second digit reflects the level of protection against liquids (water). The definition of those levels is displayed in the chart below.



From the chart we can see that, technically speaking, the dust spec has 7 different levels, level 0 to level 7 and the water spec has 9 different levels, level 0 to level 8. But, practically speaking, rugged computers all have at least a dust protection level of 5 and water protection level of at least 4. Nevertheless at the operational ends of the scale, the levels can make a big difference. For example, a dust level of 5 means that some dust can get into the unit, whereas level 6 unit is completely dust proof.

To take another example, an IP67-rated unit is totally dust proof and is capable of immersion in water for at least 30 minutes to a depth of 1 meter. This unit would be an excellent choice in either a very dusty or dirty environment or one where it may be possible to drop the unit into a body of water like a lake or a stream. On the other hand, an IP rating of IP54 is only protected in a limited way to dust and water and should never be fully immersed.

## Rugged computers for tough environments

Knowing what the specifications are and what they mean can provide invaluable information about how a unit will function in the field and over the long term. So, use the specifications to help you pick out the best unit for your situation.



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