



Buying a rugged
handheld
mobile computer
– *what you need
to know*

spirit
DATA CAPTURE LTD

The following factors should be considered when selecting a handheld mobile computer:

Design

Ergonomic design is important. Will the terminal be used for single or dual-handed operation? Is a pistol grip required? How long will the operator be using the device?

Size and weight

Does the mobile computer need to be a pocket-sized 'consumer' PDA or a more substantial device? Will the weight of the device be a problem if the users are required to carry it all day? The size and weight are important considerations, especially if your organisation is new to mobile computing, as user acceptance is key to a successful implementation.

Durability and ruggedness

Do you need a terminal that will be used in harsh environments and can withstand being dropped? Does the mobile computer need to be sealed and IP-rated? Rugged handheld mobile computers are available with IP ratings that start from IP54 (sealed against wind-blown rain and dust).

For many organisations, the loss of information or downtime caused by a damaged or broken consumer PDA can cost more than the higher price of a more rugged terminal. It's worth noting that the total cost of ownership of a rugged device is significantly lower than that of a consumer PDA over a three to five year period.

There are also semi-rugged devices on the market which are more rugged than a PDA but which have a similar size and weight.



Performance

The performance of the mobile computer can vary considerably, so it is important to select a device which has the specifications that meet your exact requirements. For example, the operating system, processor, memory and the number of applications expected to run on it will all affect its performance.

Processor

Most handheld computers lack the processing power of a PC but they are becoming increasingly powerful. Mobile computers with high speed processors are now available. The application functionality you need will help to determine whether you need a mobile computer with a powerful processor.

Memory size

Memory requirements can vary from one application to the next. The most common memory in mobile computers currently is 128Mb RAM and 128Mb ROM – but it can range as high as gigabytes. The more RAM, the better equipped the mobile computer is to support multiple applications and to maintain a consistent performance. ROM is used mainly for storing application data, as it is persistent; some applications have a minimum requirement for memory.

Barcode scanner/imager

Is an integrated barcode scanner needed? If so, what specification is required? For example, if your process uses 2D barcodes, an imager would be the best solution. If you use 1D barcodes, a laser scanner will suffice.



RFID

Is the environment harsh; does the quality of your barcodes degrade rapidly; and is it difficult to scan a large number of barcodes quickly and efficiently? If so, Radio Frequency Identification (RFID) may be an ideal solution.

RFID is a method of identifying products that uses radio waves to read the data. Unlike barcodes, RFID readers don't require 'line of sight' to read the tag and can read multiple tags in seconds. RFID tags have been available for many years. However, it is only recently, with the introduction of new standards and a reduction in the cost of the technology, that RFID is being adopted more widely for mobile computing.

Colour camera

A colour camera now features in many rugged mobile computers and rugged PDAs. Some can take high resolution images (3MP cameras are now in common use) and have a flash and Auto Focus capability, and are similar to a consumer digital camera.

Colour cameras can add value in many applications by providing additional information relating to an event. For example, in a proof of delivery application, the camera can be used to take a picture of a damaged package; or it can capture a vehicle parked illegally for a parking enforcement application. It can also provide helpful data when used in a quality control application. The high resolution images can be used within software applications to provide improved data capture methods, thus maximising your investment. Typical examples include Optical Character Recognition (OCR), Automatic Number Plate Recognition (ANPR), document capture and even barcode scanning.



Handwritten orange label on a bag, containing illegible text.

599-276

Handwritten orange label on a bag, containing illegible text.

Handwritten orange label on a bag, containing illegible text.

454

Handwritten orange label on a blue bag, containing illegible text.

Handwritten orange label on a white bag, containing illegible text.



Batch data communications

How will you transfer the data from the mobile computer to another system? Batch data communication means that the data is transferred through a direct connection, using an RS232 serial link, USB or Bluetooth link. An alternative is to use a modem connected to a telephone line (e.g. ADSL). This can be useful for remote sites where a computer network is limited. For sites that have a network, many mobile computers now have Ethernet cradle options. This allows batch data to be immediately transferred over the network without the need for a PC between the mobile computer and the network.

Radio Frequency data communication

Do you need data transfer to be instantaneous and seamless? Devices have a range of wireless options, such as Bluetooth, WLAN, GPRS and 3G. RF networks now operate at 11MB/sec and faster networks are also available. RF communication minimises the likelihood of data being lost. Security is a significant factor and it is essential that you consider this aspect for your RF network.

Global Positioning System (GPS)

Some rugged mobile computers and PDA devices include an integrated GPS receiver. This can be used with satellite navigation software (such as iDrive, Sygic, or TomTom) or for tracking purposes when used with a WWAN (such as GPRS or 3G+). Recently, mobile devices have developed a step further and have combined GPS with other tracking technologies to improve performance and reliability.



Battery life and power management

How long does the battery need to last in the application? Battery life can vary from one product to the next. Li-on batteries have increased battery life and are now standard in mobile computers. In general, batteries should be replaced every 18 months. Most rugged mobile computers have internal back-up batteries that facilitate 'hot-swapping' of the main battery in the field without any loss of work. High capacity batteries are also available.

Peripherals required

What peripherals do you need? For example, holsters are available to hold the mobile computer securely when it isn't in use. Are mobile printing, magnetic strip or smartcard reading required?

Mounting Options

Most mobile computers have a range of mounting options that can be used to charge the device as well as holding it securely. For example, car kits are very common. As mobile computers become multi-purpose, these kits can offer trickle charging throughout the day, which extends the operational lifespan of the device. Some cradles allow for external GSM and GPS antennas, so that they can be fitted in the rear of vans without the signal being lost.

Open systems environment

This environment is needed for flexibility and to enable you to change or build your application without any compatibility concerns. You should always select hardware that can communicate freely with most host systems and that can interface with wireless network providers. This should occur at both the application level and the business level. Avoid being locked into proprietary software.



Operating environment

Do you need the device to work in hazardous environments or cold stores (i.e. at temperatures down to -20°C)?

Software

What software is required? Is it possible to buy basic packages for standard applications? Is customisation or a bespoke application required?

Middleware

This may be required if you need to interface the application with the company's enterprise system.

Maintenance

What maintenance is required? If a mobile computer fails, how soon must it be back in action again? Is same-day replacement needed, to avoid downtime?

Total Cost Ownership

One of the preconceptions encountered frequently in the mobile data capture industry is the belief that rugged devices are not worth the additional cost. With 'shiny' or consumer-oriented devices such as smart phones or PDAs, the initial costs are probably lower, but these devices are much more likely to break regularly.

These 'soft costs' can be quite significant. They include the costs of getting a replacement to the field workers; reproducing any lost data; revisiting customers/sites/equipment/assets; tracking the serial number device associated with each worker; and tracking devices through the repair chain. The total cost of ownership (TCO) often ends up being much higher for shiny devices, leaving the workforce and the board of investors very disillusioned with the system and potentially rendering the investment worthless.

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Spirit is a rugged mobile data capture specialist. We offer hardware, software and pre- and post-sales support. We specialise in delivering innovative and cost effective solutions across many industries.

We hope that you have found this guide useful.

For more information contact us at: t: 01928 718800

f: 0870 762 2824 email: helen.jones@spiritdatacapture.co.uk

www.spiritdatacapture.co.uk

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