

MEDICAL PC

Focus ON

GREEN IT

ECO-FRIENDLY TECHNOLOGY



**GREEN IT IS
MORE THAN
JUST ENERGY EFFICIENCY**

PENTA

Real 'green technology' offers much more than just less energy consumption. Much higher saving potential can be realized in the area of heating or cooling systems. Two other main factors are also decisive: reliability and longevity.



An eco-friendly IT solution should not encumber the human being and the environment.



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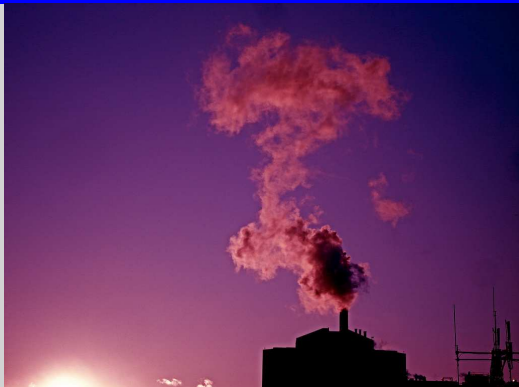
Advocating more multi-dimensional viewing of eco-friendly technology

In the medical application area, where a system's performance levels are still the most important feature, a move towards IT equipment with environmentally-friendly features has already taken place. For many manufacturers of computer systems and components the green IT label is an important sales argument, 'non-green' products can end up as slow sellers. However, a large number of system manufacturers is taking green IT credit when it is not due. The increased eco-friendliness of a product is first and foremost not a result of the special design of a PC system, but of the research and development effort of the chip manufacturers. With every new chip generation, the manufacturers succeed in coming up with not only faster but more energy-efficient processors. So better energy efficiency basically boils down to using the latest, state-of-the-art components. If therefore integrating energy-efficient CPUs deserves the green IT label then, in turn, every PC using the latest processor technology would be entitled to the 'green' label.

That, of course, is absurd and shows how uni-dimensional the approach to green IT really is. Real 'green technology' offers much more than just less energy consumption. Especially regarding the total power consumption of, for example, a hospital, here IT does not play the major role; much higher saving potential can be realized in the area of heating or cooling systems. An eco-friendly IT solution should not encumber the human being and the environment. Two other main factors in the form of reliability and longevity are also decisive.

MEDICAL PC

Green IT is more than just energy efficiency



Manufacturing and scrapping of PC systems adds up to nearly 2% of carbon dioxide emissions worldwide.

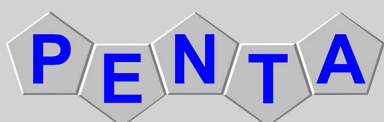


The robust design of systems, especially for use as medical PCs, is of great importance, as the equipment is exposed to much tougher environments than the normal office PC is

'Disposable' PCs are a major pollution factor

What good is an energy-saving PC to the environment anyway, if after a short time it breaks down and has to be scrapped? The (quite painful) answer is: nothing. The manufacturing and scrapping of PC systems uses up a huge amount of raw materials, causes pollution and in total, this adds up to nearly 2% of carbon dioxide emissions worldwide: That is about the same amount that is caused in international air traffic which is often labelled as the biggest 'climate killer'. In addition to this, there is the consumption of natural resources used for building the systems and the possible issues of persistent pollution due to disposal of certain materials. Really eco-friendly PCs would consequently be those that are not designed for short-term but for long-term usage. And if, despite its high degree of reliability, a PC has some type of failure, or more higher-performing system components are needed, then a modular hardware design is the answer. This would mean that singular modules could be swapped separately, the whole system however can continue to be used. That saves manufacturing materials and avoids disposal.

If you compare the possibilities of module exchange with replacement purchase of a complete PC then the modular version saves up to 75% in costs. Failures or damages do not have to be just system-immanent. Use of force or environmental impacts can afflict PCs. The robust design of systems, especially for use as medical PCs, is therefore of great importance, as the equipment is exposed to much tougher environments than the normal office PC is. The technology inside has to be protected by a hard-wearing enclosure, e.g. aluminium, which makes the medical PC resistant to knocks and vibrations and enables application in the extended temperature range of 0 to 40 °C



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Ventilation slits attract dust, even in clean rooms (the dust layer on the left of the picture is the result of six months operation in an operating theatre). Systems without fans and ventilation slits, such as the Hercules Medical from Penta, are a lot better.



Operation is extremely hygienic and takes place exclusively via the touch screen and USB handheld scanner.

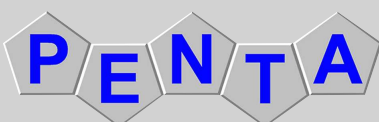
Less environmental pollution thanks to hygienic enclosures

An enclosure of this kind must, of course, meet the strictest hygiene regulations. Hygiene issues in the medical working environment are of the highest priority and they also reflect in green IT.

Medical PCs must be germfree and stay so, in order to be deployed in infection-endangered and aseptic areas and to minimize the risk of nosocomial infections. One method causes waste and is the less environmentally-friendly way: using disposable protective covers for the equipment. The other alternative is the resource-saving method: using devices that can be easily cleaned and disinfected. This can only be achieved with an enclosure that is completely closed and without joints. In a design like this, the medical PC has to have a passive cooling concept without a fan and without vents, as these collect dust which can be a breeding ground for germs. Active ventilation would also mean that when a medical PC is switched on during the start-up the fan causes dust to circulate, producing an additional problem for the PC's surroundings. The medical PC is built without a fan and is therefore quiet, so that it can be used in noise-sensitive areas, i.e. at the patient's bedside.

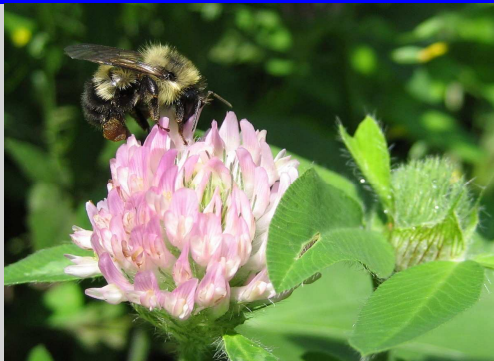
High compatibility with humans and the environment

Real green IT also takes the influence of a PC on its surroundings and on human beings into account. Aspects like leakage current and electro-magnetic compatibility play a big role too – especially in regard to electric smog. The medical PC specifications comply with the DIN norms EN60601-1 and EN60601-1-2 and therefore have minimal effect on environment and humans. Medical technical devices with DIN EN 60601-1 cannot exceed 0.5 mA (normal case) leakage current or 1 mA in the first failure case. In comparison, standard PCs are allowed 3.5mA leakage current per device (DIN EN 60950). By fulfilling this norm, the amount of current loss which otherwise would just disappear into thin air, is reduced.



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Real green IT needs an experienced system manufacturer to adapt systems to meet the special conditions of medical workplaces.

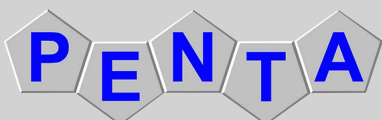
Real green IT needs an experienced system manufacturer

Real Green IT is much more than just product catalogue hype and manufacturers of green IT have to possess the right expertise, especially when they have to adapt systems to meet the special conditions of medical workplaces. The Puchheim based company, Penta GmbH, are specialists in the manufacturing of efficient, hygienic, fan-less medical PC systems. Years of experience in this field and close cooperation with IT specialists and medical staff of many different hospitals have resulted in their expertise in aseptic systems and Penta offers these expertly-adapted medical PCs with long-term stability. Over a large number of years, Penta systems have been successfully deployed in numerous intensive care units and fire victim stations. Penta's GREEN product label is new. Products in this category excel due to their fulfilment of extremely tough green IT requirements which enable their users to actively play an integral part in protecting the environment without having to forsake performance.



The modular hardware design of the Hercules Medical Express enables resource-saving exchange of individual components like the CPU.

A new development is the Hercules Medical Express PC which boasts Penta's GREEN certificate and fulfils the high level of requirements for real green IT in the medical area. The performance of the Hercules Medical Express, which has been especially designed for medical PC application, can carry out several computing tasks simultaneously and is, thanks to its passive cooling, absolutely hygienic, and because of its closed aluminium enclosure (IP65) also extremely robust. The PC can be used for applications such as medical imaging processes like endoscopy, keyhole surgery, X-ray, ultrasound or CT, real time vital data monitoring and documentation on intensive care or in the operating theatre, or as a combined command visualization computer in OEM devices and visualization computer in OEM devices.



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Green IT is more than just energy efficiency



To achieve a maximum power consumption of only 17 watts, the Hercules Medical Express relies on two economical variants of the Intel Core 2 Duo CPU used in notebook manufacturing.

Energy-efficient Core 2 Duo processors

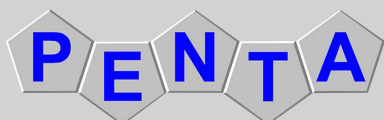
To achieve energy-efficient computing power, the Hercules Medical Express relies on two economical variants of the Intel Core 2 Duo CPU used in notebook manufacturing: Intel SL 9400 with 1.86 GHz, 6MB L2 cache and 1066 MHz FSB or Intel SU9300 with 1.2 GHz, 3 MB L2 cache and 800 MHz FSB. Both versions offer 1024 MB graphic memory and up to 8 GB DDR. The maximum power consumption of the 1.86 GHz version is 17 watts, the 1.2 GHz version only requires 10 watts. In comparison: the Intel Core 2 Duo E6320 (1.86 GHz) for desktop PCs consumes 65 watts at the same performance level.

Hercules Medical Express: A PC with longevity in mind

Modular hardware design simplifies swapping single components. The Core 2 Duo processors, which are used, have a long-term availability of seven years, guaranteed by chip manufacturer Intel. If future applications need more computing power, more powerful CPUs can easily be fitted. By not integrating active cooling systems and using especially resilient hardware components, like robust automotive hard disks or especially robust solid state drives, the result is a Hercules Medical Express with an extremely high level of reliability. The medical PCs are designed to reach a Mean Time between Failure (MTBF) of 50 000 hours – five times higher than that of conventional systems. That means, with 8 hours operation a day and 365 working days, a system failure should first be expected in 17.12 years. So the Hercules Medical Express really stands for long-term application.



Penta currently offers its fanless and completely sealed Hercules Medical family of medical PCs in several different performance categories.



User-friendly operation

The user-friendly ergonomics of the PC make it especially suited to daily use: data can be keyed in via the function keys which are programmable and an optional, wear-resistant touch screen, which can also be used wearing surgical gloves. Via six USB 2.0 interfaces different peripheral devices can be used, i. e. endoscope. The device can be integrated into the PACS or KIS network of a hospital via the standard 10/100 MBit Ethernet or optional wireless LAN.

The Penta Hercules Medical Express supports all Linux distributions along with Windows XP, Windows 2000, XP Embedded and Win CE Embedded.

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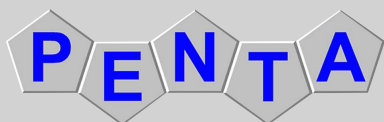
GREEN is a product label which Penta awards to its products which are especially eco-friendly. Green stands for:

Germfree,
Resource-saving,
Ecological,
Economical,
Noiseless.

This acronym underlines the fact that green IT at Penta is much more than just the integration of more economical processors. More than anything, the Penta GREEN PCs are based on a holistic, sustainable environmental concept which not only takes the energy consumption of the device into consideration but also its environmentally-friendly manufacturing, disposal and maintenance. With the germ- and dust-free enclosure and their fan-less and quiet operation, the Penta GREEN PCs additionally reduce negative impacts on their immediate surroundings.



Penta GREEN stands for five environmentally-friendly characteristics: Germless, Resource-saving, Economical, Ecological and Noiseless.



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About Penta

Penta GmbH, with its headquarters in Puchheim, Germany, and numerous worldwide sales representative offices and agencies, is the leading producer of fanless PC systems for medical technology and other industries requiring fanless, hygienic, completely closed, and robust IPC technologies. The company was founded in 1995 and has among its medical customers Schiller, Image Device, Imaging Services, Stoss Medica and Invitec as well as numerous hospitals and medical centres.

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