

Tech Note - 11

Surveillance Systems that Work!™



ATX vs. Rack Enclosures

Thermal management is key to any well-built PC-Based DVR system – digital video processing taxes virtually every component in the system. As such, virtually every component in a DVR PC will run warmer than in a traditional desktop PC. There's an old rule of thumb that is important to remember when designing and/or specifying electronic components:

For each 10°C change in temperature the effective life of the component is cut in half.

Rack enclosures have a low profile design that prohibits heat from rising. Additionally, by design, their airflow characteristics are superior to ATX cabinets. An intake fan moves fresh (outside the box) air through the hard drive bay. Internal fans continue to move the HD warmed air from front to back in the cabinet and exhaust air fan (rear mounted) continue the “through-the-cabinet” airflow out the back of the enclosure.

Alternatively, ATX cabinets, with their taller vertical profile, provide a unique thermal management challenge to the PC designer/builder. Warm air rises. Cooling air in an ATX enclosure tends to circulate (rather than flow through) more than in a server-rack cabinet design. Additionally, while ATX cabinet manufacturers add eccentric ventilation ducts to facilitate additional cooling capacity, they tend to focus on the CPU's air supply more than the overall case cooling airflow. As such, while their CPU ductwork is artful, the duct itself is an obstruction that continues to circulate air – rather than force an efficient intake and exhaust airflow.

When cooling airflow circulates it gets warmer. Circulating air further compounds an already difficult thermal management conundrum. Rather than outside air removing heat, circulating air causes every component in the machine to run warmer. For these reasons, it's GuardDog Surveillance's philosophy to build DVR systems in RU server rack type enclosure whenever possible.

If a server-style rack mount enclosure is not an option then “judicious component selection” is the rule – even if it's necessary to add additional cost. Following is a short list of GSS “best practices” in judicious component selection.

- Hard Drives are the largest cause of internal thermal gain. Minimize numbers of HD's if possible.
- Inexpensive ATX cases are not inexpensive, they're cheap – you get what you pay for.
- Larger gage metal enclosure will dissipate more heat than thinner gage metal or plastic enclosures.
- Larger diameter fans move more air than smaller diameter fans – specify big.

We trust you have found the above information helpful in the decision process regarding your new video surveillance system.