



Computerized precision farming for optimum yield

"I knew that there was variability in the field, but I did not realize that it was that extreme," says an Idaho wheat farmer using a combine equipped with GPS, and a yield monitor. "One hillside pays for the whole field."



Application:

Precision farming allows farmers to maximize crop quality and production. In addition, it can reduce pollution by monitoring yields, moisture and soil conditions in concert with GPS systems. To develop a site-specific management plan, farmers need to link data about the site's physical properties, such as elevation, to the geographic location of the site.

With this knowledge, growers can write specific plans to manage distinctive areas in their fields. Without this planning, the yield rates from one area of a field to another vary by as much as 250%. And precision farming reduces pollution by precisely gauging fertilizer needs. To make this information available to growers, Rockwell Collins developed the Vision System (see bottom photo) utilizing an Octagon single board computer. This system is mounted in the combine (photo on top). As the farmer harvests the field, the Vision System collects data for future planning.

Key factors in selecting a single board computer for the Rockwell Collins Vision System:

- Harsh environment: Wide temperature range & high vibration
- High functionality: GPS support
- Video: Large nonvolatile memory; serial communications; compact size-package installed in the cab of a combine

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Solution:

A custom version of a standard SBC with PC/104, keyboard, mouse, 6 serial ports, digital I/O, and a 586 processor all on one board, the PC325D allowed for a sophisticated mobile solution. The temperature range of the PC325D is -55° to 85° C, non operating. While the cab is climate controlled when in operation, nonoperating conditions are extreme. As in all mobile applications 20g shock and 5g vibration specifications were required.

Octagon SBCs in other mobile applications: Octagon SBCs are used on aircraft, trains, space shuttles and logging trucks.