**BIOETT**
# EMBEDDED SYSTEMS

**RAPID PRODUCT DEVELOPMENT OF EMBEDDED SYSTEMS USING LINUX**
When developing products with embedded systems a common problem is to find not only a suitable hardware platform but a development platform that is cost effective and helps the programmers to be more efficient and reuse available program code.

**A TYPICAL APPLICATION**
Aditus was contacted by Bioett to help them implement a prototype for verification of a new method for reading their chip-less RFID-tags (used for temperature monitoring). The prototype is built in three different blocks. The first analog block is used to generate and detect an RF-signal. The second block is controlling the generation and conversion of the analogue signals to digital data . The third and last block is the embedded system analyzing the data read from the RFID-tags and communicating data to other computers over Ethernet.

**PLATFORM FOR EMBEDDED SYSTEMS**
It was important to find a platform for the embedded system at the start that would make development of both hardware and software as quick and efficient as possible. As Linux is open source software and implemented on a vast number of hardware platforms; Aditus started looking for the best solution among these. The supplier best meeting our requirements was AXIS Communications AB with their processor Etrax FS. The processor supports the standard Linux software and also features a lot of the functions for the control of Ethernet communication. AXIS does not only sell their chip, but also delivers a complete development kit. The development kit is well tested and AXIS is using the same processor in their own products. AXIS also delivered a "standard" hardware design with supporting software and documentation. *More about AXIS processors*

**FAST & COST EFFECTIVE IMPLEMENTATION**
By the use of both the "standard" hardware design example and the development kit it was possible to start the hardware-work and programming-work at the same time. Running both tasks in parallel saved a lot of time and money. When the actual hardware arrived, debugging of both hardware and software together commenced. One software engineer was working with the Linux system and one hardware engineer designed the hardware. Using this method a complex project that consisted of both new measurement principles, a completely new platform for data analysis and Ethernet communication could be implemented in only three months. Cost was kept at a minimum due to choice of technology, which made it possible to reduce the number of engineers needed to develop and implement the system. In addition to this the development kit was free of charge.