

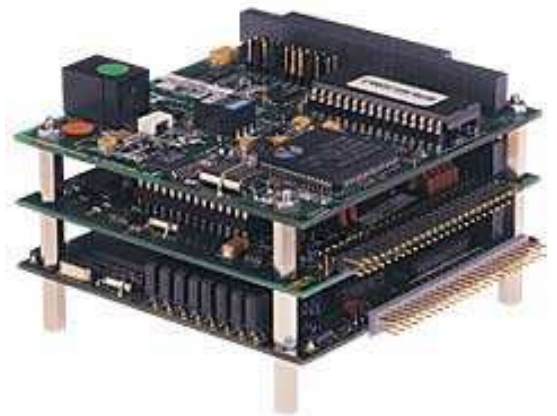
Customer

JV "Proscan Special Instruments" whose key area is development of devices for industry, scientific investigations, laboratory diagnostics, and medicine.

Objective

To develop an embedded Linux distribution for company products as a software platform together with hardware platforms on the basis of Advantech PC/104 industrial computers. The distribution should meet the following main requirements:

- OS should be based on a Flash Card of up to 64 Mb;
- RAM capacity of 64 Mb;
- File system should ensure data security at shutdown;
- File system should ensure a possibility to create, store, change own data during operation of the device;
- OS should support both text and graphics (640X480 16 bit) modes;
- OS should support a possibility to install and uninstall own programs;
- OS should function on the PC/104 and PC/104+ controllers.



Solution

A specialized Linux distribution of 6 Mb was developed for an industrial PC/104 computer, with support of Ethernet, Web-Server.

The distribution is tailored to work on Advantech PC/104 industrial computers - PCM 5820 and PCM 3350 models; on PC/104+ - the PCM3370 model. A BSP to support these hardware platforms was created.

Support of the following devices and peripherals was implemented:

- Chipset NS CX5530 core;
- RTL8139 and Intel 82559 ER network Ethernet-adapters;
- 4 COM ports;
- LPT port;
- 4 USB 2.0 High Speed ports;
- LCD, TFT, CRT screens and monitors;
- "mouse" input devices on a PS/2 port;



- keyboard working with at least two languages;
- ISA (PC/104);
- PCI (PC-104+);
- Floppy drive;
- CD-ROM drive;
- HDD drive;
- USB Mass Storage devices;
- DMA-channel of the ISA-bus;
- Possibility to add Ethernet Gigabit support.

Benefits and features

- An embedded Linux distribution supporting system utilities on the basis of busybox takes up 6Mb, which resulted in additional 58Mb (on a 64Mb Flash-card) for data storage;
- Linux OS file system is secured against unauthorized copying.

Design tools	GNU Toolchain (gcc, gdb, binutils, glibc)
Technologies	PC/104, PC/104+
Interfaces	USB, PCI, ISA, IDE, DMA, TFT/STN, CompactFlash II, Ethernet 10/100
Programming languages	C, Shell
Project management tools	dotProject, CVS
Efforts	35 man-days
Duration	1 months