

Thinvent Rural Computer Specifications

Thinvent's Rural Computer is made for appropriate and sustainable computing. The rural computing device has been put through extreme conditions such as erratic power supply, voltage fluctuations, widely varying temperature and high humidity levels. Thousands of untrained users successfully use our products everyday.

The rural computer is made on rugged, field and time proven hardware and software platforms. The hardware is made for running at low power and wide temperature range, and withstanding environmental conditions such as dust and vibration. The software augments these capabilities with features such as optimal use of the processor, automatic handling of storage errors, and the ability to reliably carry out network operations over an unreliable network.

The configuration of the rural computer depends on the specific use case of each project. The following two are our standard products that meet most common needs. We can also perform an on-site evaluation of the customer needs, and provide customised computers as per the requirements identified.

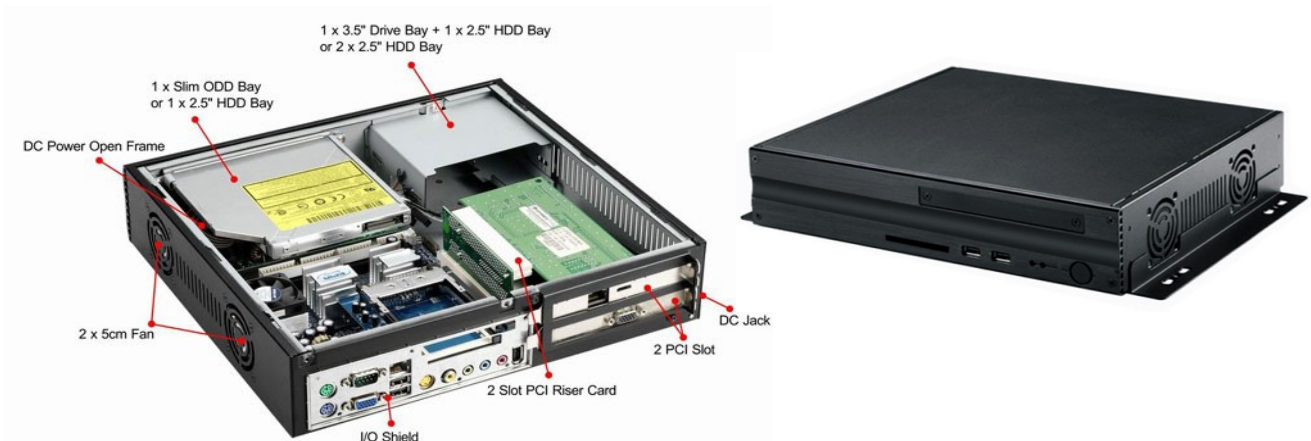


Illustration 1: RC 400 inside and outside view¹



Illustration 2: RC 300 system overview and outside view¹

¹ Please note that the fans shown in these illustrations are optional

Hardware Specification

Model →	RC300	RC400
Power Supply	12 V DC, 100W open frame	12 V DC, 100W open frame
Power Adaptor	60 to 120W AC (optional)	60 to 120W AC (optional)
Dimensions	210 × 257 × 65mm (D×W×H)	273 × 300 × 65mm (D×W×H)
Colour	Black	Black
CPU	Intel Atom 1.6GHz Fanless N230 single core / N330 dual core x86-64, HT enabled	Intel Atom 1.6GHz Fanless N230 single core / N330 dual core x86-64, HT enabled
Chipset	Intel 945GC + ICH7 533 MHz FSB	Intel 945GC + ICH7 533 MHz FSB
Graphics	Integrated 950GMA graphics core	Integrated 950GMA graphics core
RAM	DDR II × 2 DIMM, maximum 2 GB	DDR II × 2 DIMM, maximum 2 GB
Flash Drive	1/2/4 GB compact flash	1/2/4 GB compact flash
HDD	40/80/160 GB SATA 2.5"	Upto 1 TB SATA 3.5" 40/80/160 GB SATA 2.5"
ODD	Slim ODD – DVD/CDRW or DVD writer	Slim ODD – DVD/CDRW or DVD writer
PCI slot	PCI unusable	2 × PCI
Serial/Parallel	1 × 9-pin COM, 1 × Centronics parallel	1 × 9-pin COM, 1 × Centronics parallel
USB	2 front + 4 rear + 2 internal	2 front + 4 rear + 2 internal
Sound	AC97 5.1 Channel	AC97 5.1 Channel
NIC	Onboard 10/100 Mbps	Onboard 10/100 Mbps



Hardware Details

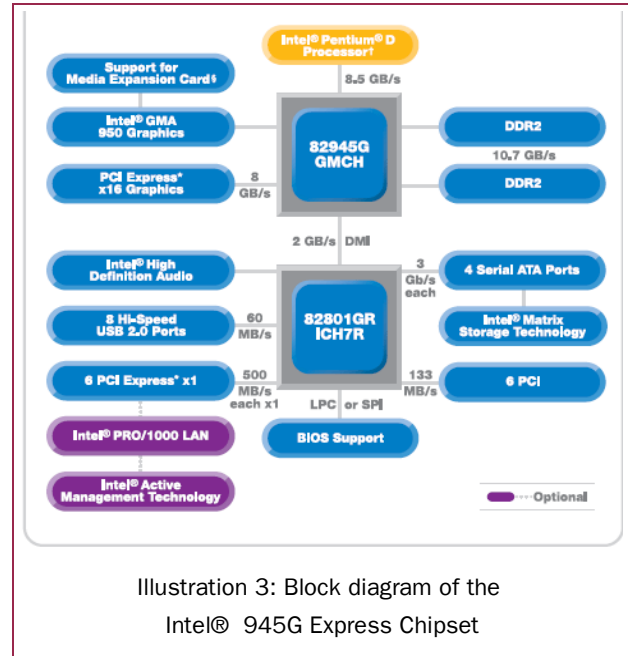
Intel® 945GC Chipset

- 1066/800/533 MHz System Bus
- PCI Express Interface
- Intel® Graphics Media Accelerator 950
- Intel® High Definition Audio
- Intel® Matrix Storage Technology
- Intel® Active Management Technology
- Serial ATA (SATA) 3 Gb/s
- Dual-Channel DDR2 Memory Support
- Intel® Flex Memory Technology

Features	Intel® 945GC
Processor Support	Intel® Atom
Front Side Bus	1066/800/533 MHz
Memory Support	DDR2 533/400 MHz
Max Memory	4.0GB
PCIx Support	PCI Express x16 graphics
North-South Bridge Link	DMI (2GB/s)
Graphics Core	Intel® 950GMA

Intel® Graphics Media Accelerator 950

- 400MHz 256-bit graphics core
- 192 MB maximum video memory
- 2048x1536 at 75 Hz maximum resolution
- High Performance 3D
 - DirectX® 9 Hardware Acceleration
 - OpenGL® 1.4 support with ARB extensions
- High Quality Media Support
 - High Definition Hardware Motion Compensation to support HD hi-bitrate MPEG2 media playback
 - Up and Down Scaling of Video Content



Intel® Atom™ Processor - built with the world's smallest transistors

- Small Form Factor CPU Package – 45nm manufacturing technology
- 533 MHz FSB, 1.60GHz frequency, single and dual core configurations
- Low Thermal Design Power (TDP) – TDP of 4W @ 1.6GHz single core, 8W for dual core
- Power-Optimized Front Side Bus
- Intel® Advanced Smart Cache
- Security features – NX bit
- Multimedia support – SSE1, SSE2 and SSE3
- Cache – 32KB instruction, 24KB data, 512KB L2.
- x86-64 instruction set architecture
- Intel® Hyper-Threading Technology – thread level parallelism for more efficient use of processor resources and improved performance



Salient Features of the Hardware

- Low power consumption
 - Ability to easily operate from alternative sources of energy such as solar energy
 - Ability to operate from a car battery for 10 hours
- No moving parts
 - Minimal wear and tear
 - Minimal noise pollution
 - Minimal power consumption
- Fanless design
 - Eliminates dust accumulation by fans
 - Eliminates vibration and noise caused by fans
 - Eliminates overheating and failures caused by failure of fans
 - Eliminates power consumption by fans
- Small and light – much easier to transport.

Power Consumption - A comparison between Rural Computer and PC

Item	Rural Computer	Personal Computer
Hardware Configuration	Intel Atom processor based, with LCD monitor	Core 2 Duo processor based, with CRT monitor
Power Consumption (peak)	50W	250W
Power Consumption (time average)	35W to 40W	200W
Energy Consumed per day (@ 12 hours operation time)	0.6 KWh	2.4 KWh
Energy cost per day (@ Rs. 4 per unit)	Rs. 2.40	Rs. 9.60
Hours of runtime from a car battery (12V 40Ah)	12 hours	2.4 hours
Battery capacity to provide 8 hours of backup	30 Ah	140 Ah
Cost of battery	~Rs. 2,000.00	~Rs. 8,000.00
Charging time of battery	4-8 hours	10-14 hours
Cost of charger	Rs. 1,000.00 to Rs. 2,000.00	Rs. 3,000.00 to Rs. 4,000.00
Cost of solar power equipment	Rs. 15,000.00 ²	Rs. 75,000.00+

Net savings with a Rural Computer:

1. Up to Rs. 3,000.00 per year in energy costs.
2. Rs. 3,000.00/year in battery replacement costs (assuming 2 year life of battery).
3. Rs. 8,000.00 upfront saving in cost of acquisition of battery and charger.

² Assuming eight hours a day of usage, cost of panel Rs. 170 per peak watt, four hours of peak radiance per day, and extra cost of charger and fittings at 10% of panel cost.



Software Specification

Rural Computers run an enhanced version of Thinvent's embedded Linux, Thinux. The salient features of Thinux are:

- Built-in remote management and monitoring
- A wide array of built-in applications
 - Web Browser, with flash, multimedia, PDF and other popular plugins.
 - Office applications suite
 - VoIP and video conferencing – suitable for telemedicine applications.
 - Audio and Video players
 - Image management and manipulation software
 - Email client
- Small footprint of less than 512 MB
- Support for Networking Protocols:
 - Remote desktop client
 - MS Windows file sharing
 - FTP client and server
 - SSH client and server
 - VNC server and client

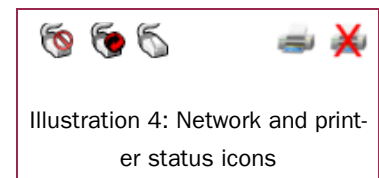
In addition, Thinvent works with end customers and adds applications that suit their requirements.

State Preservation

A computer contains large amounts of very critical data, as well as OS and application programs. A hard drive failure can lead to the loss of programs, which causes downtime and support costs. Loss of data severely impacts business delivery. Thinvent's Rural Computers augment the hard drive with flash based storage. The OS and applications are stored in a secure, read only section of the flash. Settings such as IP address are backed up centrally, so that a failed computer can be replaced quickly and easily. All critical user generated data is stored on flash, providing much higher reliability. In the event of a hard drive failure, the computer still boots. All programs and critical data are available. Hard drive recovery is automatically attempted, and audio-video and other content stored on the hard drive recovered.

User Interface Customisation

- Full support for localisation – user interface and applications in Indian languages such as Hindi and Tamil. Support for web browsing and document creating in all Indian languages.
- Intuitive icons on the screen provide network, printer and application status, making debugging easier for users and administrators.
- Autostarting of applications in kiosk mode. Application opens in full screen mode and cannot be minimised or closed. Various keys and right click can be disabled. Server or network failure is gracefully notified to the user.
- Touchscreen, smartcard and biometric integration.
- Dual display configuration for digital signage and POS.



Power Backup Solution

Power related problems are the single biggest cause of IT equipment failure. Thinvent has thus designed a power backup solution that integrates with our hardware and software, and eliminates all your power related concerns.

UPS equipment are designed to provide power backup in case of short power failures. In the rural scenario, power failures and brownouts are long drawn out. Thinvent's power backup system can sustain the rural computer for a whole day.

- Rural Computer and TFT monitor directly powered by DC.
- AC supply is converted to DC for storage in battery and supply to equipment.
- DC-UPS design – power is converted from AC to DC only once. Thereafter, the DC power stored in the battery is supplied as DC itself to the computer, monitor, etc.
- No reconversion of DC battery power to AC when providing backup.
- Works like an online UPS, providing instant switchover and higher equipment life.
- System achieves much higher efficiencies than traditional UPS.
- Ripple and noise are significantly lower, enhancing equipment life.
- Wide input range of 90V to 250V AC.
- Built in spike and surge protection.
- Handles full charging and discharging on a daily basis.

To know more about Thinvent's products for rural IT projects, please get in touch with our sales team at rural@thinvent.in.

