Matrix-504
Linux-ready ARM9 Embedded Computer

- ☑ 100% Linux 2.6.29 compatible computing platform
- ☑ ATMEL AT91SAM9G20 **400MHz** CPU
- ☑ 64MB SDRAM and 128MB **NAND** Flash
- ☑ System backup Data Flash: 2MB
- ☑ One 10/100Mbps Ethernet port
- ☑ Four 921.6Kbps high speed TTY (serial) ports
- ☑ Two USB 2.0 host ports, 12Mbps
- ☑ GNU C/C++ tool chain for Linux/Windows
- ☑ Extremely compact design, 78 x 108 x 24mm
- ☑ Ultra-low power consumption, less than 3 Watts

Introduction

The Matrix-504 is Artila's 2nd-generation ARM9- based box computer with pre-built Linux kernel and file system. It comes with a 400MHz ARM9 CPU, 128MB NAND Flash and 64MB SDRAM. Which enbales the Matrix-504 perform more tasks at the same time while retaining high responsiveness.

⊠ UBI File System & Failover Mechansim

The Matrix-504 uses UBI file system for its on-board NAND Flash. The UBI file system offers better write performance and more reliable bad-block handling over JFFS2.

If the NAND Flash file system does crash for any reason, the Matrix-504 will automatically boot up from its on-board 2MB Data Flash (read only). This failover mechanism allows users to rescue the Matrix-504 in a limited Linux environment.

⊠ Support Wire and Wireless Networking

The Matrix-504 comes one standard 10/100Mbps Ethernet port for wired networking. Besides, it is easy to add IEEE-802.11b/g WiFi support by simply plugging an USB WiFi dongle into the Matrix-504.
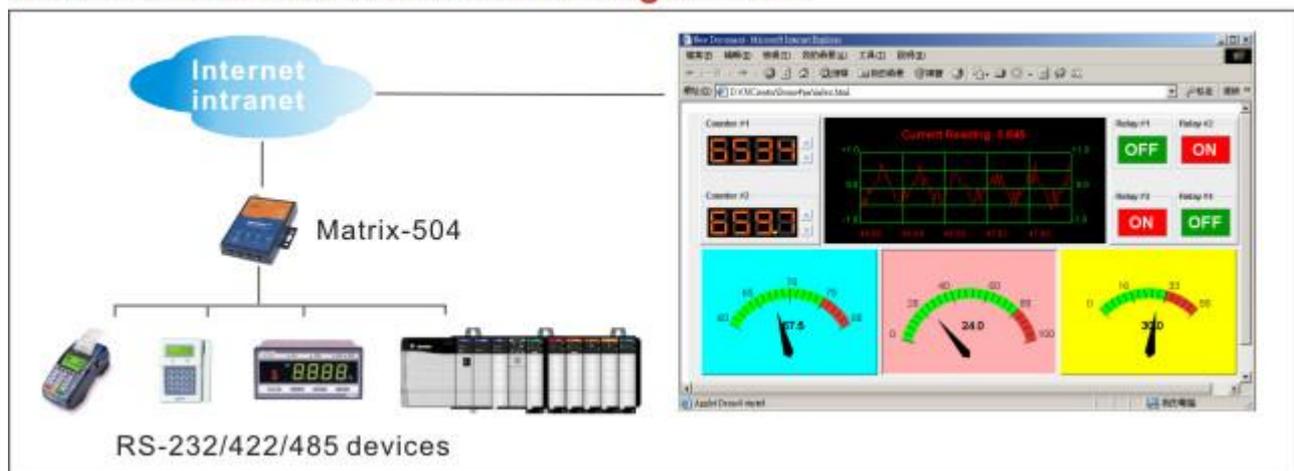
⊠ Four High Speed TTYs (Serial Interface)

The Matrix-504 provides four high-speed TTY ports: Port 1 supports RS-232/422/485 and Port 2 to Port 4 support RS-232/485. The RS-485 interface features hardware direction control to ease communication programming.

⊠ GNU Tool Chain for App. Development

Open-source GNU Tool Chain, including C/C++ cross-compiler and POSIX standard C/C++ library, is bundled with the Matrix-504 for free.

Browser-based device monitoring/control

RS-232/422/485 devices

H/W Specifications

CPU/Memory
- CPU: ATMEL 400MHz AT91SAM9G20 (ARM9, w/MMU)
- Memory: 64MB SDRAM, 128MB Flash (NAND)
- DataFlash®: 2MB, for system backup

Network Interface
- Type: 10/100BaseT, RJ-45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports
- Port 1: can be set as RS-232, RS-422, or RS-485
- Port 2,3,4: can be set RS-232 or RS-485
- Connector: RJ45 connector

TTY (Serial) Port Parameters
- Baud Rate: up to 921.6 Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5,6,7,8
- Stop Bit: 1, 1.5, 2 bits
- Flow Control: RTS/CTS, XON/XOFF, None
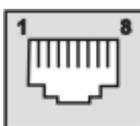- RS-485 direction control: auto, by hardware

USB Ports
- Host ports: two
- Client port: one, reserved
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full- speed (12Mbps) data rate

General
- WatchDog Timer: yes, for kernel use
- Real Time Clock: yes
- Buzzer: yes
- Power input: 9~48VDC
- Power consumption: 300mA@12VDC
- Dimension: 78 x 108 x 24mm
- Operation Temperature: 0 to 70C(32 to 158F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General
- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot 1.1.2
- File Systems: UBI, JFFS2, ETX2/ETX3, VFAT/FAT, NFS

Utilities pre-installed
- bash, busybox, sysvinit
- wget, ipkg, procps (for **webmin**), psmics,
- apache2, vsftpd, iptable, ppp, ssh
- wireless_tools, util-linux-mount/umount, usbutils
- artila utiliy
- more utilities can be found in product CD

Daemons started by default
- ssh (secured shell) with sftp
- syslog/klogd (system and kernel log)
- telnet server (disable root with /etc/securetty)
- ftp server (vsftp)
- web server (apache2)
- amgrd (Artila broadcast search daemon)

Package management & System Administrtion
- Supports **ipkg** to manage the package installation, upgrade and removal.
- Supports **webmin** (use **ipkg install webmin** to install) for Web-based system administration.

Tool Chain for Linux
- GCC: C/C++ PC cross compiler
- GLIBC: POSIX Library

USB Host Drivers
- Generic Flash drive
- RS-232 adaptors (for Prolific PL-2303 compatibles)
- WiFi dongles (for Ralink RT73 compatibles)

TTY Pin Assignment

PIN	RS-232	RS-422	RS-485
1	DSR	---	---
2	RTS	Tx+	Data+
3	GND	GND	GND
4	Tx	Tx-	Data-
5	Rx	Rx+	---
6	DCD	Rx-	---
7	CTS	---	---
8	DTR	---	---

Ordering Information

✉ **Matrix-504**

ARM9-based Linux Computer with 128MB on-board Flash, including one CD-ROM which contains GNU tool chain and user guide