Matrix-500
Linux-ready ARM9 Embedded Computer

- ☑ 100% Linux 2.6.x compatible computing platform
- ☑ 64MB SDRAM and 16MB Flash
- ☑ Ultra-low power consumption, less than 3 Watts
- ☑ One 10/100Mbps Ethernet port
- ☑ Four 921.6Kbps high speed TTY (serial) ports
- ☑ Two USB 2.0 host ports for add-on functionality expansion
- ☑ One SD memory card slot inside for storage expansion
- ☑ GNU C/C++ tool chain for Linux/Windows environment
- ☑ Extremely compact design, 78 x 108 x 24mm

Introduction

The Matrix-500 is the world's smallest Linux-ready ARM9-based computing platform for embedded headless run-only application. It comes equipped with one Ethernet, four TTY (serial) ports, two USB host ports, plus one internal SD memory card slot in an incredible small package measuring only 78x108x25 mm.

☒ 100% Linux Compatible , Hassle Free

The Matrix-500 is a true Linux computing platform and it supports versatile file systems. Users can operate the Matrix-500 the same way as they do on a normal Linux desktop.

☒ Support Wire and Wireless Networking

The Matrix-500 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-500.

☒ Four High Speed TTYs (Serial Interface)

Also, the Matrix-500 provides four 921.6Kbps high-speed TTY ports for communication with RS-232/422/485 devices. Port 1 can be configured as RS-232, RS-422 or RS-485. Port 2 features full RS-232 supporting for modem connection. Port 3 and Port 4 support standard RS-232s.
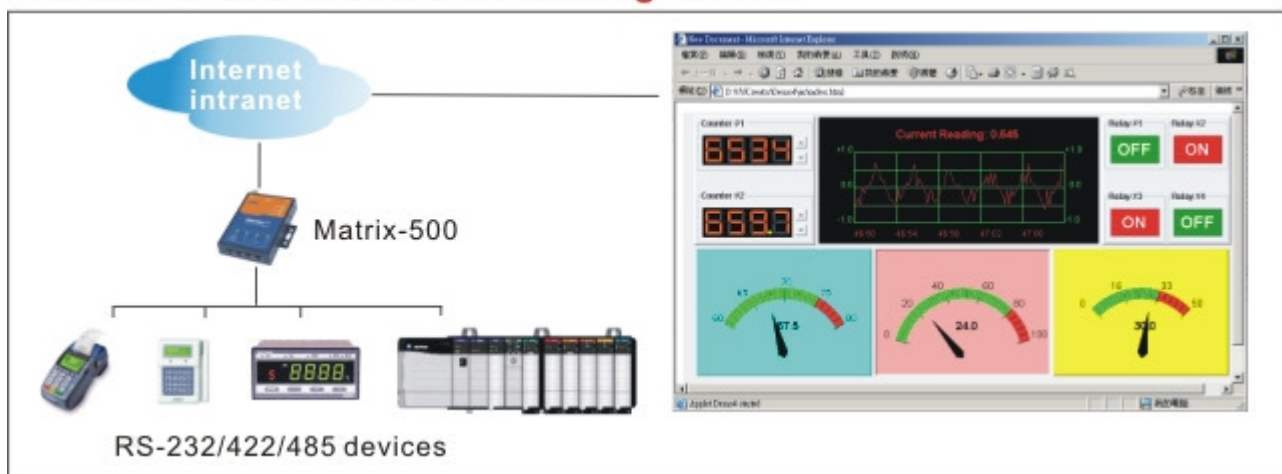
☒ Optional 2GB SD Card for Data Storage

Users can install one standard SD Flash memory card, up to 2GB now, into the Matrix-500 as an additional hard drive. This means the Matrix-500 can hold huge amount of data or web pages, which is a must-have feature needed for Web-base remote monitoring and control.

☒ GNU Tool Chain for Application Development

Open-source GNU Tool Chain, including C/C++ cross-compiler and POSIX standard C/C++ library, is bundled with the Matrix-500 for free.

Browser-based device monitoring/control

H/W Specifications

CPU/Memory
- CPU: ATMEL 180MHz AT91RM9200 (ARM9, w/MMU)
- Memory: 64MB SDRAM, 16MB Flash

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: RS-232
- 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

USB Host Ports
- No. of ports: two
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full- speed (12Mbps) data rate

Mass Storage
- One SD 1.0 compliant socket inside

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.x
- Boot Loader: U-Boot 1.1.2
- File Systems: JFFS2, ETX2/ETX3, VFAT/FAT, NFS

Protocol stacks
- IPv4, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, Telnet, HTTP, PPP, PPPoE, CHAP, PAP, SMTP, SNMP V1/V2, SSL, SSH 1.0/2.0

Utilities
- bash: shell command
- tinylogin: login and user manager utility
- telnet: Telnet client program
- busybox: Linux utility collection
- ftp: FTP client program

Daemon
- pppd: Dial In/out over serial port and PPPoE
- snmpd: SNMP agent program
- telnetd: Telnet server program
- inetd: TCP server program
- ftpd: FTP server program
- boa: Web server program
- sshd: secured shell server
- iptables: Firewall service manager
- armd: Artila manager daemon

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

Device Drivers
- SD/MMC, UART, Real Time Clock, Buzzer, Digital I/O, Ethernet, Watchdog Timer

USB Host Drivers (could be customized)
- Flash disk, WiFi (IEEE-802.11b/g), and RS-232 adaptors

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 *	---	---

* Port 2 only

Ordering Information

⊠ **Matrix-500**

ARM9-based Linux Computer with 16MB on-board Flash, including one CD-ROM which contains GNU tool chain and user guide